

CALNEV PIPELINE EXPANSION PROJECT

DRAFT GENERAL CONFORMITY DETERMINATION

Submitted to:

The Bureau of Land Management
United State Department of the Interior

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List of Acronyms and Abbreviations

AQMP	Air Quality Management Plan
BLM	Bureau of Land Management
CAA	Clean Air Act
CARB	California Air Resource Board
CCDAQ	Clark County Department of Air Quality
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CO	Carbon Monoxide
DEIS/EIR	Draft Environmental Impact Statement/Environmental Impact Report
FR	Federal Register
FTA	Federal Transit Administration
GCD	General Conformity Determination
HDD	Horizontal Directional Drilling
LLC	Limited Liability Company
MDAQMD	Mojave Desert Air Quality Management District
MPO	Metropolitan Planning Organization
NA	Not Applicable
NAAQS	National Ambient Air Quality Standard
NEPA	National Environmental Policy Act
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
NSR	New Source Review
O ₃	Ozone
PM ₁₀	Particulate Matter Less Than 10 Microns in Diameter
PM _{2.5}	Particulate Matter Less Than 2.5 Microns in Diameter
ROW	Right-of-Way
SCAQMD	South Coast Air Quality Management District
SIP	State Implementation Plan
SO ₂	Sulfur Dioxide
tpy	Tons Per Year
U.S. DOI	United States Department of the Interior
U.S. EPA	United States Environmental Protection Agency
U.S. FS	United States Forest Service
VOC	Volatile Organic Compound

SECTION 1 INTRODUCTION

Calnev Pipe Line, LLC (Calnev), an operating partnership for Kinder Morgan Energy Partners, LP, proposes to replace an existing pipeline with a larger pipeline to expand the capacity of the Calnev Pipeline System. This Calnev Pipeline Expansion Project (Calnev or the Project) would involve the construction, operation, and maintenance of a new 16-inch-diameter pipeline and ancillary facilities from an existing facility in Colton, California to an existing facility in Las Vegas, Nevada. The proposed pipeline would parallel two existing system pipelines for most of the route.

The existing system is the primary means of delivery of refined petroleum products to the California high desert and southern Nevada. The new pipeline would extend approximately 233 miles from the existing North Colton Terminal in Colton, San Bernardino County, California to the Bracken Junction near the McCarran International Airport in Las Vegas, Clark County, Nevada. In addition to the new pipeline, the Project would include a new pump station and ancillary facilities near Baker, California; a new 3-mile lateral from the Bracken Junction to McCarran International Airport; and new or modified connections to new or modified laterals, valves, and ancillary modifications. The pipeline crosses lands primarily under the jurisdiction of the United States Department of Interior (U.S. DOI) Bureau of Land Management (BLM). In addition, the proposed pipeline would cross lands under the jurisdiction of the United States Forest Service (USFS), the United States Navy, Marine Corps Logistics Base, the Counties of San Bernardino, California and Clark, Nevada, and various cities along the Interstate 15 corridor from Colton, California to Las Vegas, Nevada. The construction of Calnev will take approximately 8 months to complete. It is anticipated to start between 2013 and 2015, and to be completed no later than the end of 2015. The Project commercial operation is anticipated to start in 2016. The Project objectives are summarized below:

- Construct, operate, and maintain a new 16-inch diameter pipeline between Colton, California and Las Vegas, Nevada to increase the capacity of the existing Calnev system to meet future demand;
- Expand the existing Calnev system's capacity from 156,000 barrels per day of refined petroleum products to transport up to 200,000 barrels per day to delivery points in the California high desert and southern Nevada;
- Increase the reliability of petroleum-products delivery to the California high desert and southern Nevada; and
- Interconnect with the existing Calnev system (e.g., laterals and pump stations).

Section 176(c)(1) of the Clean Air Act (CAA) requires any entity of the federal government that engages in, supports, or in any way provides financial support for, licenses, or permits, or approves any activity, to demonstrate that the action conforms to the applicable State Implementation Plan (SIP) for achieving and maintaining the National Ambient Air Quality Standards (NAAQS) for criteria pollutants before the action is otherwise approved (General Conformity Rule). Section 176(c)(1) also assigns primary oversight responsibility for conformity assurance to the agencies themselves, not to the United States Environmental Protection Agency (U.S. EPA) or the states. Specifically, for there to be conformity, a federal action must not contribute to new violations of standards for ambient air quality, increase the frequency or severity of existing violations, or delay timely attainment of standards in the area of concern.

A General Conformity evaluation is required for project-related direct and indirect net emissions of criteria pollutants and their precursors in nonattainment or maintenance areas.

A SIP is a state's compilation of its air quality control plans and rules that will be implemented to achieve compliance with the NAAQS. Criteria pollutants are six major air pollutants for which the U.S. EPA has established NAAQS. These pollutants are ozone (O_3), particulate matter (particulate matter less than 10 microns in diameter [PM_{10}] and particulate matter less than 2.5 microns in diameter [$PM_{2.5}$]), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead.

The existing Calnev Pipeline System primarily crosses land managed by the BLM. The BLM would issue a Right-of-Way (ROW) grant across all Federal lands as defined under the Mineral Leasing Act, as amended, for construction of the Project. The Project is considered a major federal action that, under the National Environmental Policy Act (NEPA), requires an Environmental Impact Statement (EIS) and the conformity determination process needs to be conducted. As discussed above, the General Conformity Rule has been established by U.S. EPA. Therefore, Calnev will be subject to the requirements of the Federal Clean Air Act General Conformity Rule for all nonattainment and maintenance areas affected by the direct and indirect emissions from the Project.

Since the General Conformity Rule is applicable to the Project, Calnev has identified the Project affected areas to include the South Coast Air Basin (SCAB), California; the Mojave Desert Air Basin (MDAB), California; and Clark County, Nevada. Calnev has also estimated annual Project construction and operational net emissions of nonattainment and maintenance pollutants and their precursors to determine if the net emissions of these pollutants are above the General Conformity *de minimis* thresholds, and thus subject to the General Conformity Rule, and to determine whether the proposed action conforms to the SIP. This draft General Conformity Determination (GCD) for Calnev was prepared to confirm that the proposed action would conform to the applicable SIPs.

The Draft Environmental Impact Statement/Environmental Impact Report (DEIS/EIR) to assess potential impacts from the Calnev Project was prepared and published for agency and public review in March 2012. The draft GCD was not included in the DEIS/EIR, therefore this draft GCD was prepared as a stand-alone document to comply with the NEPA requirements.

SECTION 2 GENERAL CONFORMITY RULE

The General Conformity regulations establish certain procedural requirements that must be followed when preparing a General Conformity Determination. This section addresses the regulatory background, requirements, and processes of the General Conformity Rule.

2.1 GENERAL CONFORMITY REGULATORY BACKGROUND

The U.S. EPA promulgated the General Conformity Rule on November 30, 1993, in Volume 58 of the Federal Register (FR) Page 63214 (58 FR 63214) to implement the conformity provision of Title I, Section 176(c) of the federal CAA (42 U.S.C. § 7506(c)). Section 176(c)(1) requires that the federal government not engage, support, or provide financial assistance for permit or license, or approve any activity that fails to conform to an approved SIP.

The General Conformity Rule is codified in 40 Code of Federal Regulations (CFR) Part 93 (40 CFR 93), Subpart B, “*Determining Conformity of General Federal Actions to State or Federal Implementation Plans*”. The General Conformity Rule applies to all federal actions, except programs and projects that require funds or approval from the U.S. Department of Transportation (U.S. DOT), the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), or the Metropolitan Planning Organization (MPO). In lieu of a General Conformity analysis, these latter types of programs and projects must comply with the Transportation Conformity Rule promulgated by U.S. DOT on November 24, 1993 (58 FR 62197).

The federal General Conformity Rule is often incorporated into the state and local regulations. For instance, the South Coast Air Quality Management District (SCAQMD) has adopted the federal General Conformity regulations in its Regulation XIX, “*Federal Conformity Regulations*”, and Mojave Desert Air Quality Management District (MDAQMD) has adopted these regulations in Regulation XX, “*Conformity*”.

2.2 GENERAL CONFORMITY REQUIREMENTS

As defined in the CAA, Title I, Section 176(c)(1), conformity means to uphold air quality goals through reduction or elimination of NAAQS violations. Accordingly, a proposed action or activity achieves conformity if the associated pollutant emissions would not:

- Cause or contribute to new violations of any NAAQS in any area;
- Increase the frequency or severity of any existing violation of any NAAQS; or
- Delay timely attainment of any NAAQS or interim emission reductions.

The General Conformity Rule establishes conformity in coordination with and as part of the NEPA environmental review process. The General Conformity Rule affects air pollutant emissions associated with actions that are federally funded, licensed, permitted, or approved; and ensures the net emissions do not contribute to air quality degradation, or prevent the achievement of state and federal air quality goals. In short, General Conformity, if applicable, refers to the process to evaluate plans, programs, and projects

to determine and demonstrate that they satisfy the requirements of the CAA and applicable SIP. A positive GCD of a project can be shown through state emission budgets in the SIP, emission offsets, or air quality modeling.

The SCAQMD has jurisdiction over the SCAB. U.S. EPA approved the SCAQMD's 2007 Air Quality Management Plan (AQMP) PM_{2.5} portion and 8-hour ozone (1997 standard) portion on September 30, 2011 and December 15, 2011, respectively (SCAQMD, 2007). The SCAQMD published the revised draft 2012 AQMP in September 2012, and it is currently out for public review. SCAQMD hopes to submit the final version to the California Air Resource Board (CARB) and U.S. EPA by the end of 2012. Because this 2012 AQMP has not been approved by CARB and U.S. EPA or adopted by the SCAQMD, the 2007 AQMP is still the current applicable SIP to use in this GCD.

The MDAQMD has jurisdiction over the MDAB. The MDAQMD adopted its Federal 8-Hour Ozone Attainment Plan (MDAQMD, 2008) and Mojave Desert Planning Area Federal Particulate Matter Attainment Plan (MDAQMD, 1995) on June 9, 2008 and July 31, 1995, respectively. The San Bernardino portion of the MDAQMD has been designated as moderate nonattainment for the national PM₁₀ standards since 1994. However, although this portion of the air district has not been officially re-designated, it has not exceeded these standards in many years. These two SIPs were approved by CARB and U.S. EPA and adopted by MDAQMD. Therefore, they are the applicable SIPs to use in this GCD.

Likewise, Clark County Department of Air Quality (CCDAQ) has the jurisdiction over Clark County. In CCDAQ, the current applicable SIPs to use in this GCD are the 2008 8-Hour Ozone Early Progress Plan for Clark County, Nevada (CCDAQ, 2008), 2005 Carbon Monoxide State Implementation Plan Revision, and 2001 PM₁₀ State Implementation Plan for Clark County. These SIPs were approved by the U.S. EPA and adopted by the CCDAQ. CCDAQ is currently working with U.S. EPA to get the area re-designated as a maintenance area for 8-hour ozone, CO, and PM₁₀.

2.3 GENERAL CONFORMITY PROCESSES

This Draft GCD was prepared based on guidance from two documents: the U.S. EPA General Conformity Guidance (40 CFR 93, Subpart B) and the BLM draft Guidance for Conducting Air Quality General Conformity Determinations (BLM, 2012).

The process to evaluate General Conformity for a proposed federal action involves three major steps: the General Conformity applicability review and analysis, the General Conformity evaluation and determination process, and the GCD review process. The applicability review process is required for any action (if it is not exempt) that is federally funded, licensed, permitted, or approved, where the total direct and indirect net emissions for criteria pollutants and precursors in a nonattainment or maintenance area exceed the General Conformity *de minimis* rates specified in 40 CFR 93.153(b)(1) and (2). If the net emissions exceed these rates, then a GCD is required.

Based on the definitions from 40 CFR 93.153 and the U.S. EPA General Conformity Guidance, direct emissions are caused by the action itself, such as the emissions from the construction of a facility. Indirect emissions are also caused by the action, but are removed from the action in either time or space. For example, emissions from employees commuting to a facility are indirect emissions. Both direct and

indirect emissions have to be reasonably foreseeable, meaning that the emissions can be estimated based on acceptable techniques using reasonable assumptions about the type and quantity of equipment used.

After completing the General Conformity applicability review and analysis process, if the General Conformity Rule is applicable for the proposed action, then a GCD process is required. The GCD process is an assessment of whether the proposed action conforms to the applicable SIP. Positive General Conformity can be shown through state emission budgets, emission offsets, air quality modeling, or any combination of these three methods.

Per 40 CFR 51.859(d) the General Conformity Analysis must be based on the total direct and indirect net emissions from the action for the following time periods:

- for nonattainment areas - the year mandated in the CAA for attainment; and for maintenance areas - the farthest year for which emissions are projected in the approved maintenance plan;
- the year during which the emissions for the proposed action are projected to be the greatest on an annual basis; and
- any year for which the applicable SIP specifies an emission budget.

The draft GCD Guidance from the BLM outlines a ten-step process to complete a General Conformity analysis, the steps are:

- Step 1 – Determine jurisdictional and exemption applicability (Applicability Analysis);
- Step 2 – Describe the SIP status and content;
- Step 3 – Provide background information;
- Step 4 – Conduct an Air Quality impact analysis;
- Step 5 – Compare results to applicable SIP provisions and rules;
- Step 6 – Write a Conclusion Statement;
- Step 7 – Complete a conformity determination if necessary;
- Step 8 – Provide agency and public review of the draft determination;
- Step 9 – Submit for approval to the appropriate regulatory agencies; and
- Step 10 – Archive these findings.

2.4 EXEMPTION FROM GENERAL CONFORMITY ANALYSIS

As noted previously, the General Conformity requirements apply to a federal action if the net project emissions equal or exceed the General Conformity *de minimis* emission rates. The only exceptions to this applicability criterion are the topical exemptions included in 40 CFR 93.153 (c), (d), and (e). However, the emissions caused by the Calnev project do not meet any of these exempt categories, except emissions from sources that require a permit under the new source review (NSR) program or the prevention of significant deterioration (PSD) program (40 CFR 93.153 (d)(1)) as discussed below. In addition to these

exemptions, the General Conformity regulations allow each federal agency to establish a list of activities that are presumed to conform (40 CFR 93.153 (f)). The BLM has established an exemption action list and the proposed Project does not meet any of the exemption categories in that guidance, except NSR and PSD sources.

Operational emissions from existing Calnev stationary sources, such as tanks, were already permitted through the SCAQMD, MDAQMD, or the CCDAQ under NSR. The proposed Project will continue to use those existing permitted stationary sources and will not install any stationary sources that require a new permit. Although there will be increased throughput with the existing tanks, these tanks will still be covered by the NSR permits. Therefore emissions associated with the increased throughput of these existing permitted sources are exempt from GCD, thus are not included in the total General Conformity emission analysis.

SECTION 3 NONATTAINMENT AND MAINTENANCE STATUS

A Conformity Determination is required for each criteria pollutant and its precursors where the total of direct and indirect net annual emissions in a federal nonattainment or maintenance area would equal or exceed the General Conformity *de minimis* thresholds. The CAA defines nonattainment areas as geographic regions designated as not meeting one or more of the NAAQS. It requires that a SIP be prepared for each nonattainment area, and a maintenance plan be prepared for each former nonattainment area that has subsequently demonstrated compliance with the standards. The nonattainment or maintenance status and the applicable General Conformity *de minimis* thresholds in all the areas potentially affected by Calnev are shown in Table 1. The pollutant with the most nonattainment areas in the state of California and Nevada is O₃; these areas are shown on Figure 1.

The *de minimis* thresholds are based on the severity of the nonattainment status. In the SCAB, for example, the U.S. EPA has designated the basin as extreme nonattainment for O₃ (2007 standard), thus the applicable *de minimis* thresholds for O₃ precursors (VOC and NO_x) are set to 10 tons per year. For serious nonattainment PM₁₀ areas, the threshold is set at 70 tons per year. For moderate or marginal nonattainment or maintenance areas for all pollutants the thresholds are set at 100 tons per year.

There are two nonattainment areas in the MDAQMD, but these areas are not the same size. The O₃ nonattainment area is a subarea of the total air district, and the PM₁₀ nonattainment area extends across the entire air district.

Table 1
Nonattainment and Maintenance Status and General Conformity *De Minimis* Thresholds

Pollutant	Nonattainment/Maintenance Status	General Conformity <i>De Minimis</i> Thresholds (tons per year)
Los Angeles-South Coast Air Basin, California under the jurisdiction of South Coast Air Quality Management District (SCAQMD)		
O ₃	Nonattainment (Extreme, 2008 ¹)	NA
NO _x (as O ₃ precursor)	NA	10
VOC (as O ₃ precursor)	NA	10
NO ₂	Maintenance	100
CO	Maintenance	100
PM ₁₀ (direct emissions)	Nonattainment (Serious)	70
PM _{2.5} (direct emissions)	Nonattainment	100
SO ₂ (as PM _{2.5} precursor)	NA	100
NO _x (as PM _{2.5} precursor)	NA	100
Ammonia or VOC (as PM _{2.5} precursor)	NA	100

Table 1
Nonattainment and Maintenance Status and General Conformity *De Minimis* Thresholds

Pollutant	Nonattainment/Maintenance Status	General Conformity <i>De Minimis</i> Thresholds (tons per year)
Los Angeles-San Bernardino Counties (Western Mojave Desert), California under the jurisdiction of Mojave Desert Air Quality Management District (MDAQMD)		
O ₃	Nonattainment (Severe - Part of San Bernardino County, 2008 ¹)	NA
NO _x (as O ₃ precursor)	NA	25
VOC (as O ₃ precursor)	NA	25
San Bernardino County (Mojave Desert), California under the jurisdiction of Mojave Desert Air Quality Management District (MDAQMD)		
PM ₁₀ (direct emissions)	Nonattainment (Moderate)	100
Clark County, Nevada under the jurisdiction of the Clark County Department of Air Quality (CCDAQ)		
O ₃	Nonattainment (Marginal, 1997 standard) ¹	NA
NO _x (as O ₃ precursor)	NA	100
VOC (as O ₃ precursor)	NA	100
CO	Maintenance	100
PM ₁₀ (direct emissions)	Nonattainment (Serious)	70

References: U.S. EPA Greenbook, Last accessed Sep 30, 2012 (U.S. EPA, 2012)

¹ Attainment status for ozone is based on the federal 8-hour ozone (2008) standards except for Clark County, Nevada, which is classified as an attainment area for the 2008 federal 8-hour ozone standard but is still classified as a marginal nonattainment area for the 1997 federal 8-hour ozone standard.

CO = carbon monoxide

NO_X = nitrogen oxides

PM₁₀ = particulate matter less than 10 microns in diameter

PM_{2.5} = particulate matter less than 2.5 microns in diameter SO₂ = sulfur dioxide

VOC = volatile organic compound

NA = Not Applicable

SECTION 4 CALNEV PROJECT EMISSIONS

Nonattainment and maintenance criteria pollutant and precursor emissions were calculated for both the construction and operational phases of the Project. The construction emissions presented in the DEIS/EIR were incorporated into this analysis without any changes. The following is a brief summary of the calculation methodologies used for the construction and operational emissions, which are those typically recommended and approved by CARB and U.S. EPA. Since there are two nonattainment areas in the MDAQMD, and they are not the same size, emissions are presented within the O₃ nonattainment area, for the remainder of the district and summed for the entire district.

4.1 CONSTRUCTION EMISSIONS

The primary emission sources during construction include heavy construction equipment, construction vehicles, and fugitive dust from disturbed areas due to drilling, boring, excavating, soil transporting, and construction of project pipelines. Different areas along the Project route will be disturbed at different times during the 8-month construction period. These construction areas will consist of different crews including the mainline spreads, street work spreads, hammer and auger bore, horizontal directional drilling (HDD), and station work crews. Some crews may overlap, but all construction activities are included in the emission estimates.

Construction emissions were calculated from all of the aforementioned sources and broken into two main categories: non-road construction equipment (e.g. loaders, cranes, backhoes, etc.) and on-road vehicles (e.g. delivery trucks, water trucks, fuel trucks, worker vehicles, etc.). On-road vehicles were assumed to travel up to 30 miles between the construction site boundary and the destinations. Fugitive dust emissions resulting from the on-site soil disturbances by non-road equipment and activities were estimated using the URBEMIS2007 emission factors which are derived from U.S. EPA AP-42 (U.S. EPA, 1995a). A dust control efficiency of 50 percent for Project Site construction activities was assumed to be achieved for these activities by frequent watering and limiting the driving speed. The emission factors in U.S. EPA AP-42 Chapter 13.2.2 and 13.2.1 for travel on unpaved roads and paved roads were used to estimate the fugitive dust emissions from on-road vehicles. Construction equipment counts were conservatively estimated, and the emission models tend to overpredict actual emissions, thus it is expected that the construction emissions estimated are conservatively high.

Table 2 presents the estimated annual construction emissions by each air quality designation area. The construction is expected to start between 2013 and 2015 and to be completed no later than the end of 2015. Since the construction is expected to occur for a period of 8 months, it is conservatively assumed that all the emissions from this 8-months period will be in one calendar year instead of being spread over two calendar years. Detailed calculation spreadsheets and the methodologies for construction emission estimation can be found Appendix A. Further discussion is also available in Section 3.6 and Appendix C of the DEIS/EIR. It should be noted that all the calculated emissions are mitigated emissions that incorporated the Project-committed feasible emission control measures which are summarized in Table 4 of this document.

Table 2
Estimated Criteria Pollutant Construction Emissions

Nonattainment and Maintenance Area	VOC	NO_x	CO	PM₁₀	PM_{2.5}	SO₂
	Annual Emissions (tons per year)					
Los Angeles-South Coast Air Basin, CA	11	90	47	38	8	0.11
Mojave Desert Air Basin	Los Angeles-San Bernardino Counties, CA (Inside Western Mojave Desert O ₃ nonattainment area)	28	230	112	131	23
	Remainder of San Bernardino County, CA (Outside Western Mojave Desert O ₃ nonattainment area)	6	48	24	27	5
	Entire Basin	34	278	136	159	28
Clark County, Nevada	10	77	40	36	7	0.09
Project Total	299	445	223	232	43	0.52

4.2 OPERATIONAL EMISSIONS

Because the Calnev project will replace the existing pipeline with a larger pipeline to expand the capacity of the Calnev Pipeline System, no additional operations and maintenance vehicles will be required. Therefore, there is no net emission increase from mobile sources during project operation. The only emission increase will come from fugitive VOC sources which include working and breathing losses from the sump tanks and fugitives from the pipeline components including valves, flanges, connectors and pumps.

To calculate fugitive VOC emissions from the piping components, the increase in components from the existing pipeline to the new pipeline was estimated. The existing and new component counts were identified from the design drawing files, and piping and instrumentation drawings (P&IDs). A conservative 25% buffer was added to the total number of new components in order to account for potential final design changes. Fugitive VOC emissions were estimated by multiplying the emission factors obtained from the U.S. EPA Protocol for Equipment Leak Emission Estimates (U.S. EPA, 1995b) by the net increase in component counts. Sump tank VOC emissions were estimated using emission factors from U.S. EPA AP-42, Chapter 5.2, Transportation and Marketing of Petroleum Liquids.

The Project-related net operational emissions in each Project-affected nonattainment or maintenance area are summarized in Table 3. Detailed net operational emission calculations are shown in Appendix B. It should be noted that the operational emissions include the mitigation measures that the project has committed to implement, and these are summarized in Table 4.

Table 3
Estimated Criteria Pollutant Operational Emissions

Nonattainment and Maintenance Area		VOC	NO_x	CO	PM₁₀	PM_{2.5}	SO₂
		Annual Emissions (tons per year)					
Los Angeles-South Coast Air Basin, CA		0.45	0	0	0	0	0
Mojave Desert Air Basin	Los Angeles-San Bernardino Counties, CA (Inside Western Mojave Desert O ₃ nonattainment area)	0.08	0	0	0	0	0
	Remainder of San Bernardino County, CA (Outside Western Mojave Desert O ₃ nonattainment area)	0.39	0	0	0	0	0
	Entire Basin	0.47	0	0	0	0	0
Clark County, Nevada		0.22	0	0	0	0	0
Project Total		1.14	0	0	0	0	0

4.3 MITIGATION MEASURES

As discussed above, the construction and operational emissions presented in the Sections 4.1 and 4.2 are mitigated net emissions. The emission mitigation measures that the Project has committed to implement are summarized and presented in Table 4.

Table 4
Emission Mitigation Measures for Calnev Pipeline Expansion Project

Project Phase	Mitigation Measures (Control Measures)	Location
Construction Phase	Frequent watering and limiting the driving speed	All unpaved roads and construction sites
	Low Emission Construction Equipment (compliant with the applicable EPA Tier diesel engine emission standards at the time of mobilization of each applicable unit of equipment)	All construction sites
	Construction fugitive dust control plan, construction emissions reduction plan, and construction equipment documentation	All construction sites
Operation Phase	Vapor recovery and/or thermal oxidizer	New sump tanks

SECTION 5 GENERAL CONFORMITY APPLICABILITY

The General Conformity applicability reviews for Calnev are presented below in Table 5. This table summarizes and compares the emissions associated with Calnev with the different applicable General Conformity *de minimis* thresholds in each of the affected nonattainment and maintenance areas.

The construction of Calnev is expected to start between 2013 and 2015 and to be completed no later than the end of 2015. Because 2014 is a milestone year set in the applicable SIPs, this year was selected to be the representative construction year for Calnev in the General Conformity demonstration. Since operational emissions are not expected to change throughout the life of the project, the first calendar year of operations was selected for purposes of the General Conformity applicability.

As shown in Table 5, the annual emissions from Calnev are below the applicable General Conformity *de minimis* thresholds for CO, PM_{2.5}, and SO₂ for each year of construction and operation, in all nonattainment and maintenance areas. Construction emissions of NO_x and VOC exceed the General Conformity *de minimis* threshold in the year 2014 in both the SCAB and Western Mojave Desert ozone nonattainment areas. Construction emissions of PM₁₀ also exceed the General Conformity *de minimis* threshold in year 2014 in the Mojave Desert. Operational emissions of VOC do not exceed the General Conformity *de minimis* threshold in any year in any area. Construction and operational emissions of all pollutants are below the applicable General Conformity *de minimis* thresholds in Clark County. All project related emissions that are below the General Conformity *de minimis* thresholds require no further analysis and are determined to conform to the applicable SIP for the purpose of attaining the NAAQS.

Therefore, a General Conformity Determination is only required for construction emissions of NO_x and VOC in the SCAB and Western Mojave Desert ozone nonattainment areas, and for PM₁₀ in Mojave Desert.

Table 5
Comparison of the Emissions from Calnev with the General Conformity *De Minimis* Thresholds – Construction and Operation

Year/Type	VOC	NO _x	CO	PM ₁₀	PM _{2.5}	SO ₂
	Annual emissions (tons per year)					
Los Angeles-South Coast Air Basin, CA						
2014 – Construction	11	90	47	38	8	0.11
2016 and Beyond – Operation	0.45	0	0	0	0	0
Applicable General Conformity threshold	10	10	100	70	100	100
Maximum emissions	11	90	47	38	8	0.11
Exceed threshold?	Yes (2014)	Yes (2014)	No	No	No	No

Table 5
Comparison of the Emissions from Calnev with the General Conformity *De Minimis* Thresholds – Construction and Operation

Year/Type	VOC	NO_x	CO	PM₁₀	PM_{2.5}	SO₂
	Annual emissions (tons per year)					
Los Angeles-San Bernardino Counties (Western Mojave Desert), CA						
2014 – Construction	28	230	NA	NA	NA	NA
2016 and Beyond – Operation	0.08	0	NA	NA	NA	NA
Applicable General Conformity threshold	25	25	NA	NA	NA	NA
Maximum emissions	28	230	NA	NA	NA	NA
Exceed threshold?	Yes (2014)	Yes (2014)	NA	NA	NA	NA
San Bernardino Co, CA (Mojave Desert)						
2014 – Construction	NA	NA	NA	159	NA	NA
2016 and Beyond – Operation	NA	NA	NA	0	NA	NA
Applicable General Conformity threshold	NA	NA	NA	100	NA	NA
Maximum emissions	NA	NA	NA	159	NA	NA
Exceed threshold?	NA	NA	NA	Yes (2014)	NA	NA
Clark County, Nevada						
2014 – Construction	10	77	40	36	NA	NA
2016 and Beyond – Operation	0.22	0	0	0	NA	NA
Applicable General Conformity threshold	100	100	100	70	NA	NA
Maximum emissions	10	77	40	36	NA	NA
Exceed threshold?	No	No	No	No	NA	NA

Notes:

NA = Not Applicable

SECTION 6 GENERAL CONFORMITY DETERMINATION

As indicated in Section 5, a General Conformity Determination is required for NO_x and VOC in the SCAB and the Western Mojave Desert, and for PM₁₀ in the Mojave Desert, for the construction year (2014) of the Project. SCAQMD and MDAQMD staff were consulted to determine the appropriate approach for confirming the Calnev construction emissions are covered by the emissions in the applicable SIPs. The approaches and demonstration of General Conformity of the Project are discussed below.

As indicated in Section 2.2, the most recent and applicable SIP in the SCAQMD is the SCAQMD 2007 AQMP. The most recent and applicable SIPs in the MDAQMD are the MDAQMD 2008 Ozone Plan and the MDAQMD 1995 PM₁₀ Plan. These plans were prepared to accommodate growth, reduce the high levels of pollutants within the SCAB and the MDAB, meet state and federal air quality standards, and minimize the fiscal impact that pollution control measures have on the local economy. Projects found to be consistent with the growth assumptions upon which the attainment plan forecasts are based are deemed to be consistent with the plan, and would not impede attainment of the ambient air quality standards. These SIPs contain emission budgets for off-road equipment used in construction projects and transportation sources in the SCAQMD and MDAQMD jurisdiction areas. Not all of these emissions are designated to specific projects; some are associated with the projected regional growth.

Tables 6 and 7 present the Calnev construction emissions of NO_x and VOC for each emission source category compared to the emission budgets for the 2014 calendar milestone year in the SCAQMD 2007 AQMP and the MDAQMD 2008 Ozone Plan, respectively. Table 8 presents the Calnev construction emissions of PM₁₀ for each emission source category compared to the emission budgets for the 2000 calendar milestone year in the MDAQMD 1995 PM₁₀ Plan, the latest year presented, since milestone year 2014 is not included in this Plan.

Table 6
**Comparison of NO_x and VOC Emission Budgets in the SCAQMD SIP
(2007 AQMP) with Emissions from Calnev by Source Category**

Category Name Year \	SIP - Total On-road Motor Vehicles Emissions	Calnev Total On-road Emissions	Calnev to SIP - On-road Emission Fraction	SIP – Off road Equipment Emissions	Calnev Off-road Equipment Emissions	Calnev to SIP - Off-road Equipment Emission Fraction
NO_x Daily Emissions (tons per day)						
2014	292.24	0.05	0.018%	137.23	0.20	0.143%
VOC Daily Emissions (tons per day)						
2014	144.06	0.01	0.005%	60.51	0.02	0.038%

Table 7
Comparison of NO_x and VOC Emission Budgets in the MDAQMD SIP (2008 Ozone Plan) with Emissions from Calnev by Source Category

Category Name Year \	SIP - Total On-road Motor Vehicles Emissions	Calnev Total On-road Emissions	Calnev to SIP - On-road Emission Fraction	SIP - Off-road Equipment Emissions	Calnev Off-road Equipment Emissions	Calnev to SIP - Off-road Equipment Emission Fraction
NO_x Daily Emissions (tons per day)						
2014	43.37	0.09	0.22%	3.18	0.53	16.76%
VOC Daily Emissions (tons per day)						
2014	10.18	0.01	0.12%	1.32	0.06	4.72%

Table 8
Comparison of PM₁₀ Emission Budgets in MDAQMD SIP (1995 PM₁₀ Plan) with Emissions from Calnev by Source Category

Category Name Year \	SIP – Road Emissions	Calnev Total Road Emissions	Calnev to SIP - Road Emission Fraction	SIP – Mobile Source Emissions	Calnev Mobile Source Emissions	Calnev to SIP - Mobile Source Emission Fraction	SIP – Construction Emissions	Calnev Construction Emissions	Calnev to SIP - Construction Emission Fraction
PM₁₀ Annual Emissions (tons per year)									
2014 ¹	36899	137.7	0.37%	1003	12.674	1.26%	8556	8.61	0.10%

Notes:

¹ Project emissions are for calendar year 2014. SIP emissions are for calendar year 2000.

In SCAQMD, the Calnev construction emissions of NO_x and VOC are less than 0.15% of the 2014 milestone calendar year emission budgets in any of the applicable emission categories in the 2007 AQMP, as shown in Table 6. Calnev presented and discussed the estimated NO_x and VOC construction emissions with the SCAQMD Planning Department staff. SCAQMD staff indicated that the Calnev construction emissions could be covered by the reduction in emissions from the ports in SCAB due to less activity at the ports because of the recent economic recession. Therefore, the Project's emissions of NO_x and VOC would be covered by the SCAQMD 2007 AQMP NO_x and VOC emission budgets and the Project would demonstrate federal General Conformity. SCAQMD provided a letter to BLM with comments about the DEIS/EIR and conformity determination on July 6, 2012. This letter is included in Appendix C of this document.

Table 7 shows that in MDAQMD the Calnev construction emissions of NO_x and VOC are less than 0.25% of the 2014 milestone calendar year emission budgets for the on-road vehicle category in the MDAQMD 2008 Ozone Plan. The conservatively estimated project-related off-road equipment NO_x emissions represent approximately 17% of the budget in this category in the MDAQMD 2008 Ozone Plan. Due to the economic recession, many previously planned construction projects are not expected to occur in the MDAB, thereby leaving room for the Calnev construction emissions to be accounted for in the MDAQMD SIP off-road equipment emission budget. In addition, the total direct and indirect construction emissions from the Calnev are significantly less than 10% of the budget in MDAQMD 2008 Ozone Plan for NO_x. MDAQMD Rule 2002 states that actions with emissions that represent 10% or more of a nonattainment or maintenance area's total emissions of that pollutant are deemed a regionally significant action. Therefore, Calnev is not a regionally significant action based on this definition. Table 8 shows that Calnev construction emissions of PM₁₀ are less than 1.3% of the 2000 milestone calendar year emission budgets in any of the applicable emission categories in the MDAQMD 1995 PM₁₀ Plan.

The majority of the Project emissions occur during construction, which will be a short-term, one-time event. Due to the nature of the Project, the construction of the pipeline will progress across the length of the MDAQMD nonattainment area. Construction activities will not remain in one place very long, thus reducing the potential for impacts to any portion of the nonattainment area. The Project emissions presented here also include the agency required reasonable, and project committed, feasible mitigation measures. Therefore, it is concluded that the Calnev Project won't cause or contribute to a new violation of any NAAQS, interfere with the maintenance of any NAAQS, increase the frequency or severity of any existing violation of any NAAQS, or delay the timely attainment of any NAAQS in any of MDAQMD's applicable Plans.

MDAQMD Planning Department staff was consulted, and they indicated that the short-term construction emissions from the Calnev project should be covered in the emission budgets allocated in the existing and upcoming new SIPs. MDAQMD staff has indicated they would concur with a positive conformity finding for the project.

In conclusion, it is anticipated that the Project would demonstrate and achieve a positive General Conformity because it will conform to the approved applicable SIPs for the SCAQMD and the MDAQMD. In Clark County, Nevada, all criteria pollutants and their precursors emissions were below the General Conformity *de minimis* thresholds, indicating that the General Conformity regulations and determination are not required for the Project in that area.

The proposed action has been analyzed under section 176 (c) of the CAA, as amended, and 40 CFR 93.150 - 165, and the selected action in SCAQMD and MDAQMD has been determined to be in conformity with the applicable SIPs for the purpose of attaining the NAAQS.

SECTION 7 REFERENCES

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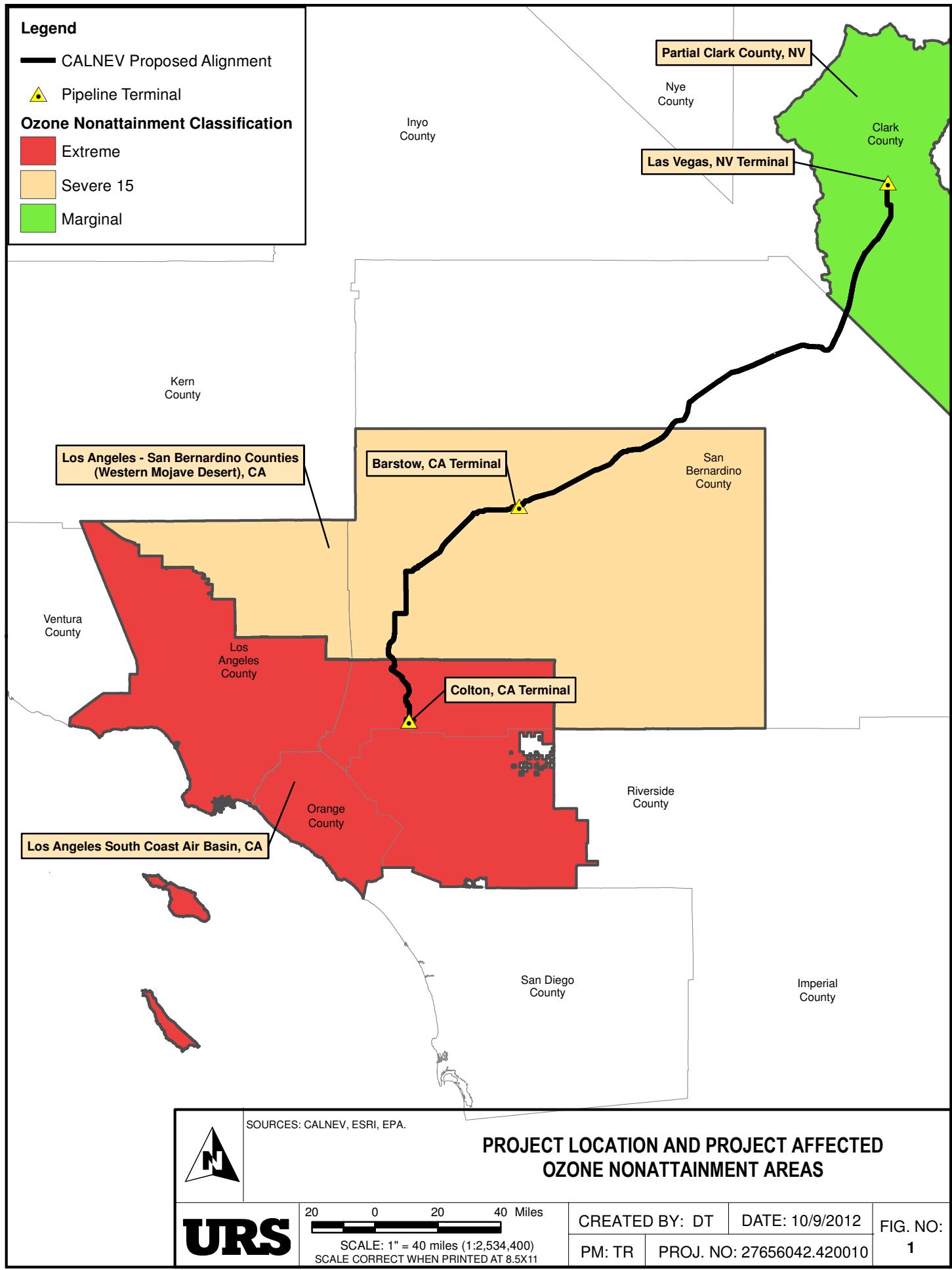
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FIGURE 1

**Project Location and Project Affected Ozone
Nonattainment Areas**



APPENDIX A
DETAILED CONSTRUCTION EMISSION CALCULATIONS

Appendix A - Part I
Construction Emission Calculations
Calnev Expansion Project

Table No.	Title
Table 1	Construction Spread and Spread Information
Table 2	Summary of Total Construction Emissions
Table 3	Summary of Daily Construction Emissions - SCAB
Table 4	Summary of Total Construction Emissions - SCAB
Table 5	Summary of Daily Construction Emissions - MDAB
Table 6	Summary of Total Construction Emissions - MDAB (Portion Inside Western Mojave Desert Ozone NAA)
Table 7	Summary of Total Construction Emissions - MDAB (Portion Outside Western Mojave Desert Ozone NAA)
Table 8	Summary of Total Construction Emissions - MDAB (All Areas)
Table 9	Summary of Daily Construction Emissions - Clark County, NV
Table 10	Summary of Total Construction Emissions - Clark Co., NV (Portion in HAs 164A, 164B, and 165)
Table 11	Summary of Total Construction Emissions - Clark Co., NV (Portion in HA 212)
Table 12	Summary of Total Construction Emissions - Clark Co., NV (All Areas)
Table 13	Non-Road Equipment - Mainline Spreads Nos. 1 and 2
Table 14	Non-Road Equipment - Street Work Spreads Nos. 1, 2, and 3
Table 15	Non-Road Equipment - Hammer Bore and Auger Bore Crews
Table 16	Non-Road Equipment - HDD Crews and Station Crews
Table 17	Non-Road Equipment Exhaust Emission Factors
Table 18	Emissions for Non-Road Equipment - Mainline Spread Nos. 1 and 2
Table 19	Emissions for Non-Road Equipment - Street Work Spread Nos. 1, 2, and 3
Table 20	Emissions for Non-Road Equipment - Hammer Bore and Auger Bore Crews
Table 21	Emissions for Non-Road Equipment - HDD and Station Work Crews
Table 22	On-Road Vehicles - Mainline and Street Work Spreads
Table 23	On-Road Vehicles - Hammer Bore and Auger Bore Crews
Table 24	On-Road Vehicles - HDD and Station Crews
Table 25	On-Road Vehicle Exhaust Emission Factors
Table 26	Emissions for On-Road Vehicles
Table 27	Fugitive Dust Emissions - Construction Sites
Table 28	Fugitive Dust Emission Factors - Roads
Table 29	Fugitive Dust Emissions for Roads

Table 1
Construction Spread and Spread Information
Calnev Expansion Project

Spread / Crew	Description of Work	Work Duration			No. of Personnel	Work Location(s)	Air Basin	Area	Work Distribution by Air Basin ^a
		Months	Weeks	Days					
Mainline Spread No. 1	Pipeline Installation - cross country/off-road	8	33	198	110	MP 29 to MP 58	MDAB	Western Mojave Ozone NAA	100%
Mainline Spread No. 2	Pipeline Installation - cross country/off-road	8	33	198	200	MP 58 to MP 135	MDAB	Western Mojave Ozone NAA	45%
						MP 135 to MP 195	MDAB	-	35%
						MP 195 to MP 217	Clark Co., NV	HAs 164A, 164B, 165	13%
						MP 217 to MP 228	Clark Co., NV	HA 212	7%
Street Work Spread No. 1	Roadway	8	33	198	75	MP 0 to MP 11	SCAB	-	100%
Street Work Spread No. 2	Roadway	8	33	198	75	MP 11 to MP 23	SCAB	-	67%
						MP 23 to MP 29	MDAB	Western Mojave Ozone NAA	33%
Street Work Spread No. 3	Roadway	8	33	198	75	MP 228 to MP 233	Clark Co., NV	HA 212	100%
Hammer Bore Crew	Water, railroad and highway crossings	7	28	168	10	Various	SCAB	-	33%
							MDAB	Western Mojave Ozone NAA	25%
							MDAB	-	25%
							Clark Co., NV	HAs 164A, 164B, 165	10%
							Clark Co., NV	HA 212	7%
Auger Bore Crew	Water, railroad and highway crossings	7	28	168	15	Various	SCAB	-	33%
							MDAB	Western Mojave Ozone NAA	25%
							MDAB	-	25%
							Clark Co., NV	HAs 164A, 164B, 165	10%
							Clark Co., NV	HA 212	7%
HDD Crew No. 1	Water, railroad and highway crossings	7	28	168	14	Various	SCAB	-	100%
HDD Crew No. 2	Water, railroad and highway crossings	7	28	168	14	Various	MDAB	Western Mojave Ozone NAA	100%
HDD Crew No. 3	Water, railroad and highway crossings	7	28	168	14	Various	MDAB	Western Mojave Ozone NAA	50%
							Clark Co., NV	HA 212	50%
Station Work Crew No. 1	Station upgrades	4	16	92	20	Colton	SCAB	-	20%
						Cajon Pass, Adelanto, Lenwood, Barstow, Yermo	MDAB	Western Mojave Ozone NAA	80%
Station Work Crew No. 2	Station upgrades	4	16	92	20	Baker, Silver Lake, Cima	MDAB	-	50%
						Sunrise, Bracken, McCarran, and Las Vegas	Clark Co., NV	HA 212	50%

Key:

MDAB = Mojave Desert Air Basin (San Bernardino County, California)

SCAB = South Coast Air Basin (San Bernardino County, California)

HDD = Horizontal Directional Drilling

Notes:

a Estimations based on current Project Description information

Table 2
Summary of Total Construction Emissions
Calnev Expansion Project

Location	Sub-Region	Emissions (tons)						GHG Emissions (metric tons)		
		VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	CO ₂	CH ₄	Total CO _{2e}
SCAB	-	11	47	90	0.11	38	8	9,616	0.8	9,634
MDAB	Inside Western Mojave Ozone NAA	28	112	230	0.27	131	23	23,064	2.1	23,112
	Outside Western Mojave Ozone NAA	5.9	24	48	0.055	27	4.9	4,647	0.45	4,657
	<i>Subtotal</i>	33	136	277	0.32	159	28	27,711	2.5	27,770
Clark County, NV	HAs 164A, 164B, and 165	2.0	8.2	16	0.019	10	1.7	1,593	0.15	1,596
	HA 212	7.5	32	61	0.074	26	5.3	6,415	0.56	6,428
	<i>Subtotal</i>	10	40	77	0.093	36	7.0	8,008	0.71	8,025
TOTAL		54	222	445	0.53	232	43	45,335	4.0	45,428

Table 3
Summary of Daily Construction Emissions - SCAB
Calnev Expansion Project

Spread / Crew	Emission Type	Source	Emissions (lbs/day)					
			VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}
Street Work Spread No. 1	Exhaust Emissions	Non Road Equipment	40	136	302	0.34	16	16
		On Road Vehicles	14	95	106	0.15	3.9	3.3
	Fugitive Dust Emissions	Construction Activities	-	-	-	-	15	3.2
		Roads	-	-	-	-	115	12
	Subtotal		53	231	408	0.49	150	34
	Exhaust Emissions	Non Road Equipment	40	136	302	0.34	16	16
		On Road Vehicles	14	95	106	0.15	3.9	3.3
	Fugitive Dust Emissions	Construction Activities	-	-	-	-	15	3.2
		Roads	-	-	-	-	115	12
	Subtotal		53	231	408	0.49	150	34
Street Work Spread No. 2	Exhaust Emissions	Non Road Equipment	40	136	302	0.34	16	16
		On Road Vehicles	14	95	106	0.15	3.9	3.3
	Fugitive Dust Emissions	Construction Activities	-	-	-	-	15	3.2
		Roads	-	-	-	-	115	12
	Subtotal		53	231	408	0.49	150	34
	Exhaust Emissions	Non Road Equipment	5.9	21	61	0.068	2.2	2.2
		On Road Vehicles	1.2	8.3	9.3	0.013	0.34	0.29
	Fugitive Dust Emissions	Construction Activities	-	-	-	-	10	2.1
		Roads	-	-	-	-	33	3.3
	Subtotal		7.1	29	70	0.081	45	7.9
Hammer Bore Crew	Exhaust Emissions	Non Road Equipment	8.8	37	73	0.085	3.5	3.5
		On Road Vehicles	0.9	6.6	7.4	0.011	0.27	0.23
	Fugitive Dust Emissions	Construction Activities	-	-	-	-	10	2.1
		Roads	-	-	-	-	28	2.8
	Subtotal		10	43	80	0.10	42	8.7
	Exhaust Emissions	Non Road Equipment	30	106	318	0.41	12	12
		On Road Vehicles	6.8	47	53	0.076	2.0	1.7
	Fugitive Dust Emissions	Construction Activities	-	-	-	-	10	2.1
		Roads	-	-	-	-	187	19
	Subtotal		37	154	371	0.49	211	34
Station Work Crew No. 1	Exhaust Emissions	Non Road Equipment	28	85	183	0.22	9.8	9.8
		On Road Vehicles	2.3	16	18	0.026	0.66	0.57
	Fugitive Dust Emissions	Construction Activities	-	-	-	-	10	2.1
		Roads	-	-	-	-	26	2.7
	Subtotal		30	101	201	0.24	47	15
	TOTAL		190	789	1,538	1.9	644	135

Table 4
Summary of Total Construction Emissions - SCAB
Calnev Expansion Project

Spread / Crew	Emission Type	Source	Emissions (tons)						GHG Emissions (metric tons)		
			VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	CO ₂	CH ₄	Total CO ₂ e
Street Work Spread No. 1	Exhaust Emissions	Non Road Equipment	3.5	12	27	0.030	1.4	1.4	2,503	0.28	2,509
		On Road Vehicles	1.1	8.0	9.0	0.013	0.33	0.28	1,186	0.050	1,187
	Fugitive Dust Emissions	Construction Activities	-	-	-	-	0.9	0.19	-	-	-
		Roads	-	-	-	-	9.7	1.0	-	-	-
	Subtotal		4.6	20	36	0.043	12	2.9	3,689	0.33	3,696
Street Work Spread No. 2 ¹	Exhaust Emissions	Non Road Equipment	2.3	8.0	18	0.020	0.95	0.95	1,677	0.19	1,681
		On Road Vehicles	0.8	5.4	6.0	0.009	0.22	0.19	794.6	0.03	795
	Fugitive Dust Emissions	Construction Activities	-	-	-	-	0.6	0.13	-	-	-
		Roads	-	-	-	-	6.5	0.67	-	-	-
	Subtotal		3.1	13	24	0.029	8.3	1.9	2,471	0.22	2,477
Hammer Bore Crew ²	Exhaust Emissions	Non Road Equipment	0.13	0.47	1.4	0.0015	0.051	0.051	139	0.011	139
		On Road Vehicles	0.033	0.23	0.26	0.00037	0.010	0.0081	34	0.0014	34
	Fugitive Dust Emissions	Construction Activities	-	-	-	-	0.16	0.034	-	-	-
		Roads	-	-	-	-	0.91	0.09	-	-	-
	Subtotal		0.17	0.70	1.6	0.0019	1.1	0.18	173	0.012	173
Auger Bore Crew ³	Exhaust Emissions	Non Road Equipment	0.20	0.84	1.7	0.0019	0.081	0.081	160	0.016	160
		On Road Vehicles	0.026	0.18	0.20	0.00029	0.0076	0.0065	27	0.0011	27
	Fugitive Dust Emissions	Construction Activities	-	-	-	-	0.16	0.034	-	-	-
		Roads	-	-	-	-	0.77	0.078	-	-	-
	Subtotal		0.23	1.0	1.9	0.0022	1.0	0.20	187	0.017	187
HDD Crew No. 1	Exhaust Emissions	Non Road Equipment	2.1	7.4	22	0.028	0.80	0.80	2,462	0.17	2,466
		On Road Vehicles	0.47	3.3	3.7	0.0053	0.14	0.12	482	0.020	483
	Fugitive Dust Emissions	Construction Activities	-	-	-	-	0.5	0.10	-	-	-
		Roads	-	-	-	-	13	1.3	-	-	-
	Subtotal		2.5	11	26	0.034	14	2.3	2,944	0.19	2,949
Station Work Crew No. 1 ⁴	Exhaust Emissions	Non Road Equipment	0.20	0.61	1.3	0.0016	0.070	0.070	133	0.016	133
		On Road Vehicles	0.018	0.13	0.14	0.00021	0.0053	0.0045	19	0.00080	19
	Fugitive Dust Emissions	Construction Activities	-	-	-	-	0.06	0.012	-	-	-
		Roads	-	-	-	-	0.22	0.022	-	-	-
	Subtotal		0.22	0.74	1.5	0.0018	0.35	0.11	152	0.017	152
TOTAL			11	47	90	0.11	38	7.6	9,616	0.79	9,634

Notes:

1. Emissions in SCAB based on 67% of total emissions for Street Work Spread No. 2.
2. Emissions in SCAB based on 33% of total emissions for Hammer Bore Crew.
3. Emissions in SCAB based on 33% of total emissions for Auger Bore Crew.
4. Emissions in SCAB based on 20% of total emissions for Station Work Crew No. 1.

Table 5
Summary of Daily Construction Emissions - MDAB
Calnev Expansion Project

Spread / Crew	Emission Type	Source	Emissions (lbs/day)						
			VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	
Mainline Spread No. 1	Exhaust Emissions	Non Road Equipment	144	513	1,195	1.3	58	58	
		On Road Vehicles	25	175	196	0.28	7.3	6.2	
	Fugitive Dust Emissions	Construction Activities	-	-	-	-	60	13	
		Roads	-	-	-	-	693	70	
Subtotal			169	689	1,392	1.58	819	146	
Mainline Spread No. 2	Exhaust Emissions	Non Road Equipment	144	513	1,195	1.3	58	58	
		On Road Vehicles	25	175	196	0.28	7.3	6.2	
	Fugitive Dust Emissions	Construction Activities	-	-	-	-	60	13	
		Roads	-	-	-	-	693	70	
Subtotal			169	689	1,392	1.6	819	146	
Street Work Spread No. 2	Exhaust Emissions	Non Road Equipment	40	136	302	0.34	16	16	
		On Road Vehicles	14	95	106	0.15	3.9	3.3	
	Fugitive Dust Emissions	Construction Activities	-	-	-	-	15	3.2	
		Roads	-	-	-	-	115	12	
Subtotal			53	231	408	0.49	150	34	
Hammer Bore Crew	Exhaust Emissions	Non Road Equipment	5.9	21	61	0.068	2.2	2.2	
		On Road Vehicles	1.2	8.3	9.3	0.013	0.34	0.29	
	Fugitive Dust Emissions	Construction Activities	-	-	-	-	10	2.1	
		Roads	-	-	-	-	33	3.3	
Subtotal			7.1	29	70	0.081	45	7.9	
Auger Bore Crew	Exhaust Emissions	Non Road Equipment	8.8	37	73	0.085	3.5	3.5	
		On Road Vehicles	0.9	6.6	7.4	0.011	0.27	0.23	
	Fugitive Dust Emissions	Construction Activities	-	-	-	-	10	2.1	
		Roads	-	-	-	-	28	3	
Subtotal			10	43	80	0.10	42	9	
HDD Crew No. 2	Exhaust Emissions	Non Road Equipment	30	106	318	0.41	12	12	
		On Road Vehicles	6.8	47	53	0.076	2.0	1.7	
	Fugitive Dust Emissions	Construction Activities	-	-	-	-	10	2.1	
		Roads	-	-	-	-	187	19	
Subtotal			37	154	371	0.49	211	34	
HDD Crew No. 3	Exhaust Emissions	Non Road Equipment	30	106	318	0.41	12	12	
		On Road Vehicles	6.8	47	53	0.076	2.0	1.7	
	Fugitive Dust Emissions	Construction Activities	-	-	-	-	10	2.1	
		Roads	-	-	-	-	187	19	
Subtotal			37	154	371	0.49	211	34	
Station Work Crew No. 1	Exhaust Emissions	Non Road Equipment	28	85	183	0.22	9.8	9.8	
		On Road Vehicles	2.3	16	18	0.026	0.66	0.57	
	Fugitive Dust Emissions	Construction Activities	-	-	-	-	10	2.1	
		Roads	-	-	-	-	26	2.7	
Subtotal			30	101	201	0.24	47	15	
Station Work Crew No. 2	Exhaust Emissions	Non Road Equipment	28	85	183	0.22	9.8	9.8	
		On Road Vehicles	2.3	16	18	0.026	0.66	0.57	
	Fugitive Dust Emissions	Construction Activities	-	-	-	-	10	2.1	
		Roads	-	-	-	-	26	2.7	
Subtotal			30	101	201	0.24	47	15	
TOTAL			540	2,190	4,486	5.3	2,389	442	

Table 6
Summary of Total Construction Emissions - MDAB (Portion Inside Western Mojave Desert Ozone NAA)
Calnev Expansion Project

Spread / Crew	Emission Type	Source	Emissions (tons)						GHG Emissions (metric tons)		
			VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	CO ₂	CH ₄	Total CO ₂ e
Mainline Spread No. 1	Exhaust Emissions	Non Road Equipment	12	43	100	0.1	4.9	4.9	9,116	1.0	9,140
		On Road Vehicles	2.2	16	17	0.025	0.65	0.55	2,298	0.10	2,301
	Fugitive Dust Emissions	Construction Activities	-	-	-	-	3.7	0.8	-	-	-
		Roads	-	-	-	-	62	6.2	-	-	-
	Subtotal		15	59	118	0.1	71	12	11,415	1.1	11,440
	Mainline Spread No. 2 ¹	Exhaust Emissions	5.5	19	45	0.0	2.2	2.2	4,102	0.45	4,113
		On Road Vehicles	1.0	7.0	7.8	0.011	0.29	0.25	1,034	0.044	1,035
		Fugitive Dust Emissions	Construction Activities	-	-	-	1.7	0.35	-	-	-
		Roads	-	-	-	-	28	2.8	-	-	-
		Subtotal		6.5	26	53	0.1	32	5.6	5,137	0.50	5,148
	Street Work Spread No. 2 ²	Exhaust Emissions	1.1	4.0	8.8	0.010	0.47	0.47	826	0.093	828
		On Road Vehicles	0.38	2.7	3.0	0.0043	0.11	0.094	391	0.017	392
		Fugitive Dust Emissions	Construction Activities	-	-	-	0.30	0.06	-	-	-
		Roads	-	-	-	-	3.2	0.33	-	-	-
		Subtotal		1.5	6.6	12	0.014	4.1	1.0	1,217	0.11	1,220
	Hammer Bore Crew ³	Exhaust Emissions	0.10	0.35	1.1	0.0012	0.038	0.038	105	0.0083	106
		On Road Vehicles	0.025	0.17	0.19	0.0003	0.007	0.006	26	0.0011	26
		Fugitive Dust Emissions	Construction Activities	-	-	-	0.12	0.026	-	-	-
		Roads	-	-	-	-	0.69	0.069	-	-	-
		Subtotal		0.13	0.5	1.2	0.0015	0.9	0.14	131	0.0094	131
	Auger Bore Crew ⁴	Exhaust Emissions	0.15	0.63	1.3	0.0015	0.061	0.061	121	0.012	121
		On Road Vehicles	0.020	0.14	0.16	0.00022	0.006	0.005	20	0.0009	20
		Fugitive Dust Emissions	Construction Activities	-	-	-	0.12	0.03	-	-	-
		Roads	-	-	-	-	0.59	0.059	-	-	-
		Subtotal		0.17	0.77	1.4	0.0017	0.8	0.15	142	0.013	142
	HDD Crew No. 2	Exhaust Emissions	2.1	7.4	22	0.028	0.80	0.80	2,462	0.17	2,466
		On Road Vehicles	0.47	3.3	3.7	0.0053	0.14	0.12	482	0.020	483
		Fugitive Dust Emissions	Construction Activities	-	-	-	0.5	0.10	-	-	-
		Roads	-	-	-	-	13	1.3	-	-	-
		Subtotal		2.5	11	26	0.034	14	2.3	2,944	0.19	2,949
	HDD Crew No. 3 ⁵	Exhaust Emissions	1.0	3.7	11	0.014	0.40	0.40	1,231	0.085	1,233
		On Road Vehicles	0.23	1.6	1.8	0.0026	0.068	0.058	241	0.010	241
		Fugitive Dust Emissions	Construction Activities	-	-	-	0.25	0.052	-	-	-
		Roads	-	-	-	-	6.5	0.65	-	-	-
		Subtotal		1.3	5.3	13	0.017	7.2	1.2	1,472	0.10	1,474
	Station Work Crew No. 1 ⁶	Exhaust Emissions	0.80	2.4	5.3	0.0062	0.28	0.28	531	0.065	532
		On Road Vehicles	0.074	0.51	0.58	0.0008	0.021	0.018	76	0.0032	76
		Fugitive Dust Emissions	Construction Activities	-	-	-	0.22	0.046	-	-	-
		Roads	-	-	-	-	0.88	0.089	-	-	-
		Subtotal		0.87	3.0	5.8	0.0070	1.4	0.44	606	0.069	608
TOTAL			28	112	230	0.27	131	23	23,064	2.1	23,112

Notes:

1. Emissions in MDAB based on 45% of total emissions for Mainline Spread No. 2.
2. Emissions in MDAB based on 33% of total emissions for Street Work Spread No. 2.
3. Emissions in MDAB based on 25% of total emissions for Hammer Bore Crew.
4. Emissions in MDAB based on 25% of total emissions for Auger Bore Crew.
5. Emissions in MDAB based on 50% of total emissions for HDD Crew No. 3.
6. Emissions in MDAB based on 80% of total emissions for Station Work Crew No. 1.

Table 7
Summary of Total Construction Emissions - MDAB (Portion Outside Western Mojave Desert Ozone NAA)
Calnev Expansion Project

Spread / Crew	Emission Type	Source	Emissions (tons)						GHG Emissions (metric tons)			
			VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	CO ₂	CH ₄	Total CO _{2e}	
Mainline Spread No. 2 ¹	Exhaust Emissions	Non Road Equipment	4.3	15	35	0.038	1.7	1.7	3,191	0.35	3,199	
		On Road Vehicles	0.78	5.5	6.1	0.0088	0.23	0.19	804	0.034	805	
	Fugitive Dust Emissions	Construction Activities	-	-	-	-	1.3	0.27	-	-	-	
		Roads	-	-	-	-	22	2.2	-	-	-	
	Subtotal		5.1	21	41	0.05	25	4.3	3,995	0.39	4,004	
	Hammer Bore Crew ²	Non Road Equipment	0.10	0.35	1.1	0.0012	0.038	0.038	105	0.0083	106	
		On Road Vehicles	0.025	0.17	0.19	0.0003	0.007	0.006	26	0.0011	26	
		Construction Activities	-	-	-	-	0.12	0.026	-	-	-	
		Roads	-	-	-	-	0.69	0.069	-	-	-	
	Subtotal		0.13	0.53	1.2	0.0015	0.9	0.14	131	0.0094	131	
Auger Bore Crew ³	Exhaust Emissions	Non Road Equipment	0.15	0.63	1.26	0.0015	0.061	0.061	121	0.012	121	
		On Road Vehicles	0.020	0.14	0.16	0.0002	0.006	0.005	20	0.0009	20	
	Fugitive Dust Emissions	Construction Activities	-	-	-	-	0.12	0.026	-	-	-	
		Roads	-	-	-	-	0.59	0.059	-	-	-	
	Subtotal		0.17	0.77	1.4	0.0017	0.8	0.15	142	0.013	142	
	Station Work Crew No. 2 ⁷	Non Road Equipment	0.50	1.5	3.3	0.0039	0.18	0.18	332	0.041	333	
		On Road Vehicles	0.046	0.32	0.36	0.0005	0.013	0.011	47	0.0020	47	
		Construction Activities	-	-	-	-	0.14	0.029	-	-	-	
		Roads	-	-	-	-	0.5	0.06	-	-	-	
Subtotal			0.55	1.8	3.7	0.0044	0.9	0.27	379	0.043	380	
TOTAL			5.9	24	48	0.055	27	4.9	4,647	0.45	4,657	

Notes:

1. Emissions in MDAB based on 35% of total emissions for Mainline Spread Crew No. 2.
2. Emissions in MDAB based on 25% of total emissions for Hammer Bore Crew.
3. Emissions in MDAB based on 25% of total emissions for Auger Bore Crew.
7. Emissions in MDAB based on 50% of total emissions for Station Work Crew No. 2.

Table 8
Summary of Total Construction Emissions - MDAB (All Areas)
Calnev Expansion Project

Spread / Crew	Emission Type	Source	Emissions (tons)						GHG Emissions (metric tons)			
			VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	CO ₂	CH ₄	Total CO _{2,e}	
Mainline Spread No. 1	Exhaust Emissions	Non Road Equipment	12	43	100	0.11	4.9	4.9	9,116	1.0	9,140	
		On Road Vehicles	2.2	16	17	0.025	0.65	0.55	2,298	0.10	2,301	
	Fugitive Dust Emissions	Construction Activities	-	-	-	-	3.7	0.8	-	-	-	
		Roads	-	-	-	-	62	6.2	-	-	-	
	Subtotal		15	59	118	0.13	71	12	11,415	1.1	11,440	
	Mainline Spread No. 2	Exhaust Emissions	Non Road Equipment	10	35	80	0.087	3.9	3.9	7,293	0.81	7,312
			On Road Vehicles	1.8	12	14	0.020	0.52	0.44	1,839	0.08	1,840
		Fugitive Dust Emissions	Construction Activities	-	-	-	-	3.0	0.6	-	-	-
			Roads	-	-	-	-	49	5.0	-	-	-
		Subtotal		12	47	94	0.11	57	10	9,132	0.88	9,152
	Street Work Spread No. 2	Exhaust Emissions	Non Road Equipment	1.1	4.0	8.8	0.010	0.47	0.47	826	0.093	828
			On Road Vehicles	0.38	2.7	3.0	0.0043	0.11	0.094	391	0.017	392
		Fugitive Dust Emissions	Construction Activities	-	-	-	-	0.30	0.06	-	-	-
			Roads	-	-	-	-	3.2	0.33	-	-	-
		Subtotal		1.5	6.6	12	0.014	4.1	1.0	1,217	0.11	1,220
	Hammer Bore Crew	Exhaust Emissions	Non Road Equipment	0.20	0.71	2.1	0.0023	0.077	0.077	211	0.017	211
			On Road Vehicles	0.05	0.35	0.39	0.0006	0.014	0.012	51	0.002	51
		Fugitive Dust Emissions	Construction Activities	-	-	-	-	0.25	0.052	-	-	-
			Roads	-	-	-	-	1.4	0.14	-	-	-
		Subtotal		0.25	1.1	2.5	0.0029	1.7	0.28	262	0.019	263
	Auger Bore Crew	Exhaust Emissions	Non Road Equipment	0.30	1.3	2.5	0.0029	0.12	0.12	242	0.025	243
			On Road Vehicles	0.04	0.28	0.31	0.00045	0.011	0.010	41	0.0017	41
		Fugitive Dust Emissions	Construction Activities	-	-	-	-	0.25	0.05	-	-	-
			Roads	-	-	-	-	1.17	0.12	-	-	-
		Subtotal		0.34	1.5	2.8	0.0034	1.6	0.30	283	0.026	284
	HDD Crew No. 2	Exhaust Emissions	Non Road Equipment	2.1	7.4	22	0.028	0.80	0.80	2,462	0.17	2,466
			On Road Vehicles	0.47	3.3	3.7	0.0053	0.14	0.12	482	0.02	483
		Fugitive Dust Emissions	Construction Activities	-	-	-	-	0.5	0.10	-	-	-
			Roads	-	-	-	-	13	1.3	-	-	-
		Subtotal		2.5	11	26	0.034	14	2.3	2,944	0.19	2,949
	HDD Crew No. 3	Exhaust Emissions	Non Road Equipment	1.0	3.7	11	0.014	0.40	0.40	1,231	0.085	1,233
			On Road Vehicles	0.23	1.6	1.8	0.0026	0.068	0.058	241	0.010	241
		Fugitive Dust Emissions	Construction Activities	-	-	-	-	0.25	0.052	-	-	-
			Roads	-	-	-	-	6.5	0.65	-	-	-
		Subtotal		1.3	5.3	13	0.017	7.2	1.2	1,472	0.095	1,474
	Station Work Crew No. 1	Exhaust Emissions	Non Road Equipment	0.80	2.4	5.3	0.0062	0.28	0.28	531	0.065	532
			On Road Vehicles	0.07	0.51	0.58	0.0008	0.021	0.018	76	0.0032	76
		Fugitive Dust Emissions	Construction Activities	-	-	-	-	0.22	0.05	-	-	-
			Roads	-	-	-	-	0.88	0.09	-	-	-
		Subtotal		0.87	3.0	5.8	0.0070	1.4	0.44	606	0.069	608
	Station Work Crew No. 2	Exhaust Emissions	Non Road Equipment	0.50	1.5	3.3	0.0039	0.18	0.18	332	0.041	333
			On Road Vehicles	0.05	0.32	0.36	0.0005	0.013	0.011	47	0.002	47
		Fugitive Dust Emissions	Construction Activities	-	-	-	-	0.14	0.029	-	-	-
			Roads	-	-	-	-	0.55	0.056	-	-	-
		Subtotal		0.55	1.8	3.7	0.0044	0.9	0.27	379	0.043	380
TOTAL				33	136	277	0.32	159	28	27,711	2.5	27,770

Table 9
Summary of Daily Construction Emissions - Clark County, NV
Calnev Expansion Project

Spread / Crew	Emission Type	Source	Emissions (lbs/day)						
			VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	
Mainline Spread No. 2	Exhaust Emissions	Non Road Equipment	144	513	1,195	1.3	58	58	
		On Road Vehicles	25	175	196	0.28	7.3	6.2	
	Fugitive Dust Emissions	Construction Activities	-	-	-	-	60	13	
		Roads	-	-	-	-	693	70	
	Subtotal		169	689	1,392	1.6	819	146	
	Street Work Spread No. 3	Exhaust Emissions	40	136	302	0.34	16	16	
		On Road Vehicles	13.6	95	106	0.15	3.9	3.3	
		Fugitive Dust Emissions	Construction Activities	-	-	-	15	3.2	
		Roads	-	-	-	-	115	12	
	Subtotal		53	231	408	0.49	150	34	
Hammer Bore Crew	Exhaust Emissions	Non Road Equipment	5.9	21	61	0.068	2.2	2.2	
		On Road Vehicles	1.2	8.3	9.3	0.013	0.34	0.29	
	Fugitive Dust Emissions	Construction Activities	-	-	-	-	10	2.1	
		Roads	-	-	-	-	33	3.3	
	Subtotal		7.1	29	70	0.081	45	7.9	
	Auger Bore Crew	Exhaust Emissions	8.8	37	73	0.085	3.5	3.5	
		On Road Vehicles	0.9	6.6	7.4	0.011	0.27	0.23	
		Fugitive Dust Emissions	Construction Activities	-	-	-	10	2.1	
		Roads	-	-	-	-	28	2.8	
	Subtotal		10	43	80	0.10	42	8.7	
HDD Crew No. 3	Exhaust Emissions	Non Road Equipment	30	106	318	0.41	12	12	
		On Road Vehicles	6.8	47	53	0.076	2.0	1.7	
	Fugitive Dust Emissions	Construction Activities	-	-	-	-	10	2.1	
		Roads	-	-	-	-	187	19	
	Subtotal		37	154	371	0.49	211	34	
	Station Work Crew No. 2	Exhaust Emissions	28	85	183	0.22	9.8	9.8	
		On Road Vehicles	2.3	16	18	0.026	0.66	0.57	
		Fugitive Dust Emissions	Construction Activities	-	-	-	10	2.1	
		Roads	-	-	-	-	26	2.7	
Subtotal			30	101	201	0.24	47	15	
TOTAL			305	1,247	2,522	3.0	1,313	247	

Table 10
Summary of Total Construction Emissions - Clark Co., NV (Portion in HAs 164A, 164B, and 165)
Calnev Expansion Project

Spread / Crew	Emission Type	Source	Emissions (tons)						GHG Emissions (metric tons)		
			VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	CO ₂	CH ₄	Total CO _{2e}
Mainline Spread No. 2 ¹	Exhaust Emissions	Non Road Equipment	1.6	5.6	13	0.014	0.63	0.63	1,185	0.13	1,188
		On Road Vehicles	0.29	2.0	2.3	0.0033	0.08	0.07	299	0.013	299
	Fugitive Dust Emissions	Construction Activities	-	-	-	-	0.5	0.10	-	-	-
		Roads	-	-	-	-	8.0	0.81	-	-	-
	Subtotal		1.9	7.6	15	0.017	9	1.6	1,484	0.14	1,487
	Hammer Bore Crew ²	Exhaust Emissions	0.041	0.14	0.42	0.00047	0.015	0.015	42	0.0033	42
		On Road Vehicles	0.010	0.070	0.078	0.00011	0.0029	0.0025	10	0.0004	10
		Fugitive Dust Emissions	Construction Activities	-	-	-	0.05	0.010	-	-	-
		Roads	-	-	-	-	0.28	0.028	-	-	-
	Subtotal		0.05	0.21	0.50	0.00058	0.34	0.056	52	0.0038	53
Auger Bore Crew ³	Exhaust Emissions	Non Road Equipment	0.060	0.25	0.50	0.00059	0.024	0.024	48	0.0049	49
		On Road Vehicles	0.008	0.055	0.062	0.00009	0.002	0.002	8.2	0.0003	8.2
	Fugitive Dust Emissions	Construction Activities	-	-	-	-	0.05	0.010	-	-	-
		Roads	-	-	-	-	0.23	0.024	-	-	-
	Subtotal		0.068	0.31	0.56	0.00068	0.31	0.060	57	0.0053	57
TOTAL			2.0	8.2	16	0.019	10	1.7	1,593	0.15	1,596

Notes:

1. Emissions in Clark Co., NV based on 13% of total emissions for Mainline Spread No. 2.
2. Emissions in Clark Co., NV based on 10% of total emissions for Hammer Bore Crew.
3. Emissions in Clark Co., NV based on 10% of total emissions for Auger Bore Crew.

Table 11
Summary of Total Construction Emissions - Clark Co., NV (Portion in HA 212)
Calnev Expansion Project

Spread / Crew	Emission Type	Source	Emissions (tons)						GHG Emissions (metric tons)			
			VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	CO ₂	CH ₄	Total CO _{2e}	
Mainline Spread No. 2 ¹	Exhaust Emissions	Non Road Equipment	0.9	3.0	7.0	0.0076	0.3	0.3	638	0.07	640	
		On Road Vehicles	0.16	1.1	1.2	0.0018	0.05	0.04	161	0.007	161	
	Fugitive Dust Emissions	Construction Activities	-	-	-	-	0.26	0.054	-	-	-	
		Roads	-	-	-	-	4.3	0.43	-	-	-	
	Subtotal		1.0	4.1	8.3	0.009	5.0	0.9	799	0.08	801	
	Street Work Spread No. 3	Exhaust Emissions	Non Road Equipment	3.5	12	27	0.030	1.4	1.4	2,503	0.28	2,509
			On Road Vehicles	1.1	8.0	9.0	0.013	0.33	0.28	1,186	0.050	1,187
		Fugitive Dust Emissions	Construction Activities	-	-	-	-	0.9	0.19	-	-	-
			Roads	-	-	-	-	10	1.0	-	-	-
		Subtotal		4.6	20	36	0.043	12	2.9	3,689	0.33	3,696
	Hammer Bore Crew ²	Exhaust Emissions	Non Road Equipment	0.029	0.10	0.29	0.00033	0.011	0.011	30	0.0023	30
			On Road Vehicles	0.0070	0.05	0.05	0.00008	0.0020	0.0017	7.2	0.0003	7.2
		Fugitive Dust Emissions	Construction Activities	-	-	-	-	0.035	0.007	-	-	-
			Roads	-	-	-	-	0.19	0.019	-	-	-
		Subtotal		0.036	0.15	0.35	0.00041	0.24	0.039	37	0.0026	37
	Auger Bore Crew ³	Exhaust Emissions	Non Road Equipment	0.042	0.18	0.35	0.00041	0.017	0.017	34	0.0035	34
			On Road Vehicles	0.006	0.039	0.043	0.00006	0.0016	0.0014	6	0.0002	6
		Fugitive Dust Emissions	Construction Activities	-	-	-	-	0.035	0.0073	-	-	-
			Roads	-	-	-	-	0.16	0.017	-	-	-
		Subtotal		0.05	0.22	0.4	0.00047	0.22	0.042	40	0.004	40
	HDD Crew No. 3 ⁴	Exhaust Emissions	Non Road Equipment	1.0	3.7	11	0.014	0.40	0.40	1,231	0.085	1,233
			On Road Vehicles	0.23	1.6	1.8	0.0026	0.068	0.058	241	0.010	241
		Fugitive Dust Emissions	Construction Activities	-	-	-	-	0.25	0.052	-	-	-
			Roads	-	-	-	-	6.5	0.65	-	-	-
		Subtotal		1.3	5.3	13	0.017	7.2	1.2	1,472	0.10	1,474
	Station Work Crew No. 2 ⁵	Exhaust Emissions	Non Road Equipment	0.50	1.5	3.3	0.0039	0.18	0.18	332	0.041	333
			On Road Vehicles	0.046	0.32	0.36	0.00052	0.013	0.011	47	0.0020	47
		Fugitive Dust Emissions	Construction Activities	-	-	-	-	0.14	0.029	-	-	-
			Roads	-	-	-	-	0.55	0.056	-	-	-
		Subtotal		0.55	1.8	3.7	0.0044	0.9	0.27	379	0.043	380
TOTAL				7.5	32	61	0.074	26	5.3	6,415	0.56	6,428

Notes:

1. Emissions in Clark Co., NV based on 7% of total emissions for Mainline Spread Crew No. 2.
2. Emissions in Clark Co., NV based on 7% of total emissions for Hammer Bore Crew.
3. Emissions in Clark Co., NV based on 7% of total emissions for Auger Bore Crew.
4. Emissions in Clark Co., NV based on 50% of total emissions for HDD Crew No. 3.
5. Emissions in Clark Co., NV based on 50% of total emissions for Station Work Crew No. 2.

Table 12
Summary of Total Construction Emissions - Clark Co., NV (All Areas)
Calnev Expansion Project

Spread / Crew	Emission Type	Source	Emissions (tons)						GHG Emissions (metric tons)			
			VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	CO ₂	CH ₄	Total CO ₂ e	
Mainline Spread No. 2 ¹	Exhaust Emissions	Non Road Equipment	2.5	8.6	20	0.022	1.0	1.0	1,823.3	0.20	1,828	
		On Road Vehicles	0.4	3.1	3.5	0.005	0.1	0.1	459.7	0.019	460	
	Fugitive Dust Emissions	Construction Activities	-	-	-	-	0.7	0.2	-	-	-	
		Roads	-	-	-	-	12.3	1.2	-	-	-	
	Subtotal		2.9	12	24	0.027	14.2	2.5	2,283	0.22	2,288	
	Street Work Spread No. 3	Exhaust Emissions	Non Road Equipment	3.5	12	27	0.030	1.4	1.4	2,502.8	0.3	2,509.3
			On Road Vehicles	1.1	8.0	9.0	0.013	0.3	0.3	1,185.9	0.1	1,187.1
		Fugitive Dust Emissions	Construction Activities	-	-	-	-	0.9	0.2	-	-	-
			Roads	-	-	-	-	9.7	1.0	-	-	-
		Subtotal		4.6	20	36	0.043	12	2.9	3,689	0.33	3,696
	Hammer Bore Crew ²	Exhaust Emissions	Non Road Equipment	0.069	0.24	0.71	0.0008	0.026	0.026	72	0.0057	72
			On Road Vehicles	0.017	0.12	0.13	0.0002	0.005	0.004	17	0.0007	17
		Fugitive Dust Emissions	Construction Activities	-	-	-	-	0.08	0.018	-	-	-
			Roads	-	-	-	-	0.47	0.047	-	-	-
		Subtotal		0.09	0.36	0.85	0.0010	0.58	0.10	89	0.0064	89
	Auger Bore Crew ³	Exhaust Emissions	Non Road Equipment	0.10	0.43	0.85	0.0010	0.042	0.042	82	0.0084	83
			On Road Vehicles	0.013	0.094	0.105	0.0002	0.004	0.003	14	0.0006	14
		Fugitive Dust Emissions	Construction Activities	-	-	-	-	0.08	0.018	-	-	-
			Roads	-	-	-	-	0.40	0.040	-	-	-
		Subtotal		0.12	0.53	1.0	0.0012	0.53	0.10	96	0.0090	97
	HDD Crew No. 3 ⁴	Exhaust Emissions	Non Road Equipment	1.0	3.7	11	0.014	0.40	0.40	1,231	0.085	1,233
			On Road Vehicles	0.23	1.6	1.8	0.003	0.068	0.058	241	0.010	241
		Fugitive Dust Emissions	Construction Activities	-	-	-	-	0.25	0.052	-	-	-
			Roads	-	-	-	-	6.5	0.65	-	-	-
		Subtotal		1.3	5.3	13	0.017	7.2	1.2	1,472	0.10	1,474
	Station Work Crew No. 2 ⁵	Exhaust Emissions	Non Road Equipment	0.50	1.5	3.29	0.0039	0.18	0.18	332	0.041	333
			On Road Vehicles	0.05	0.32	0.36	0.0005	0.013	0.011	47	0.002	47
		Fugitive Dust Emissions	Construction Activities	-	-	-	-	0.14	0.029	-	-	-
			Roads	-	-	-	-	0.55	0.056	-	-	-
		Subtotal		0.55	1.8	3.7	0.0044	0.9	0.27	379	0.043	380
TOTAL				10	40	77	0.093	36	7.0	8,008	0.71	8,025

Notes:

1. Emissions in Clark Co., NV based on 20% of total emissions for Mainline Spread Crew No. 2.
2. Emissions in Clark Co., NV based on 17% of total emissions for Hammer Bore Crew.
3. Emissions in Clark Co., NV based on 17% of total emissions for Auger Bore Crew.
4. Emissions in Clark Co., NV based on 50% of total emissions for HDD Crew No. 3.
5. Emissions in Clark Co., NV based on 50% of total emissions for Station Work Crew No. 2.

Table 13
Non-Road Equipment - Mainline Spreads Nos. 1 and 2
Calnev Expansion Project

(Data Listed are for Each Spread)

EQUIPMENT DESCRIPTION	Fuel Type	Engine Rating per Unit (hp)	Daily Operation per Unit (hr/day)	Total Working Days per Unit	No. of Units									Total Daily Operation of All Units (hr/day)	Total Overall Operation of All Units (hr)		
					Pot-holing	R/W Clearing	Ditching	Pipe Bending	Pipe Welding	Pipe Install	Backfill Pipe	P/L Hydrotest	Supervision	TOTAL			
FORKLIFT, 8000+ LBS	Diesel	110	5	198										2	2	10	1,980
D8N DOZER W/WINCH(HYSTER)-CAT	Diesel	310	7.5	168		6	2								8	60	10,080
571G PIPELAYER-CAT	Diesel	200	5	168					10						10	50	8,400
572G PIPELAYER-CAT	Diesel	180	5	168						10					10	50	8,400
TRENCHING MACHINE	Diesel	185	7.5	168			2								2	15	2,520
315CL EXCAVATOR-CAT W/COMP. WHEEL	Diesel	115	7.5	168							3				3	22.5	3,780
325BL EXCAVATOR-CAT	Diesel	188	7.5	168			6								6	45	7,560
330BL EXCAVATOR-CAT	Diesel	204	7.5	168			2			2					4	30	5,040
330BL EXCAVATOR/AUX HYD-HAMMER-CAT	Diesel	204	7.5	168			3								3	22.5	3,780
16-30 BENDING MACHINE-CRC	Diesel	100	2.5	168				2							2	5	840
590SL BACKHOE 4WD-CASE	Diesel	110	7.5	168	2		2			2					6	45	7,560
RD90B READSCREEN	Diesel	42	5	168							2				2	10	1,680
OZZIE PADDER	Diesel	325	7.5	168							2				2	15	2,520
950G WHEEL LOADER 4YD-CAT	Diesel	197	7.5	168							4				4	30	5,040
12G MOTOR GRADER-CAT	Diesel	135	7.5	168		3									3	22.5	3,780
14G MOTOR GRADER-CAT	Diesel	150	7.5	168							3				3	22.5	3,780
RT-518 CRANE-GROVE	Diesel	110	5	168					1						1	5	840
RT-630 CRANE-GROVE	Diesel	160	5	168						1					1	5	840
390 AIR COMPRESSOR-QUINCY	Diesel	37	5	168			2								2	10	1,680
1500 AIR COMPRESSOR-IR	Diesel	460	10	168						2					2	20	3,360
SA250 WELD MACHINE-LINCOLN	Diesel	40	7.5	168					12	8					20	150	25,200
60KW GENERATOR-IR	Diesel	72	10	168						6					6	60	10,080
100KW GENERATOR-COLEMAN	Diesel	110	10	168						6					6	60	10,080
G260KW GENERATOR-IR	Diesel	310	10	168						6					6	60	10,080
FT83 TEST/FILL PUMP-SABRE	Diesel	181	10	168								2			2	20	3,360
3" PUMP MQ	Gas	4	10	168			4								4	40	6,720
CD150M 6" PUMP-GODWIN	Diesel	90	10	168			6								6	60	10,080

Table 14
Non-Road Equipment - Street Work Spreads Nos. 1, 2, and 3
Calnev Expansion Project

(Data Listed are for Each Spread)

EQUIPMENT DESCRIPTION	Fuel Type	Engine Rating per Unit (hp)	Daily Operation per Unit (hr/day)	Total Working Days per Unit	No. of Units								Total Daily Operation of All Units (hr/day)	Total Overall Operation of All Units (hr)	
					Pot-holing	Ditching	Pipe Bending	Pipe Welding	Pipe Install	Backfill Pipe	Repave & Clean-Up	Supervision			
2 TON FLATBED W/10 TON CRANE	Diesel	350	4	168				1					1	4	672
3 AXL FLATBED W/12+ TON CRANE	Diesel	350	4	168					1				1	4	672
FORKLIFT, 8000+ LBS	Diesel	110	4	198								1	1	4	792
571G PIPELAYER-CAT	Diesel	310	6	168				2					2	12	2,016
572G PIPELAYER-CAT	Diesel	200	4	168					2				2	8	1,344
TRENCHING MACHINE	Diesel	180	4	168		1							1	4	672
315CL EXCAVATOR-CAT W/COMP. WHEEL	Diesel	115	6	168						1			1	6	1,008
330BL EXCAVATOR-CAT	Diesel	204	6	168		2							2	12	2,016
16-30 BENDING MACHINE-CRC	Diesel	100	2	168			1						1	2	336
420D BACKHOE-CAT	Diesel	93	6	168	1								1	6	1,008
430D BACKHOE-CAT	Diesel	102	6	168					1				1	6	1,008
OZZIE PADDER	Diesel	325	6	168						1			1	6	1,008
936E WHEEL LOADER 3YD-CAT	Diesel	140	6	168						1			1	6	1,008
950G WHEEL LOADER 4YD-CAT	Diesel	197	6	168						1			1	6	1,008
RT-630 CRANE-GROVE	Diesel	160	4	168				1					1	4	672
RT-860B CRANE-GROVE	Diesel	190	4	168					1				1	4	672
P/33/24 TRENCH COMPACTOR-RAMMEX	Diesel	18	6	168						4			4	24	4,032
P185 WD AIR COMPRESSOR-IR	Diesel	78	4	168				2	2				4	16	2,688
390 AIR COMPRESSOR-QUINCY	Diesel	37	4	168				1	1				2	8	1,344
1500 AIR COMPRESSOR-IR	Diesel	460	8	168					2				2	16	2,688
SA250 WELD MACHINE-LINCOLN	Diesel	40	6	168				2	4				6	36	6,048
60KW GENERATOR-IR	Diesel	72	8	168				2					2	16	2,688
G115KW GENERATOR-IR	Diesel	125	8	168					2				2	16	2,688
G260KW GENERATOR-IR	Diesel	310	8	198					2				2	16	3,168
3" PUMP MQ	Gas	4	8	198		4							4	32	6,336
CD150M 6" PUMP-GODWIN	Diesel	90	8	198		4							4	32	6,336
ASPHALT ZIPPER 480	Diesel	110	6	168		1							1	6	1,008
8-HC SWEEPER-LAYMOR	Diesel	30	4	168						1			1	4	672
3-5 TON SMOOTH DRUM ROLLER	Diesel	43	8	168						1			1	8	1,344
CONCRETE-AC.SAW	Diesel	5	8	168		2							2	16	2,688

Table 15
Non-Road Equipment - Hammer Bore and Auger Bore Crews
Calnev Expansion Project

Hammer Bore Crew

EQUIPMENT DESCRIPTION	Fuel Type	Engine Rating per Unit (hp)	Daily Operation per Unit (hr/day)	Total Working Days per Unit	No. of Units		Total Daily Operation of All Units (hr/day)	Total Overall Operation of All Units (hr)
					Boring	TOTAL		
2 TON FLATBED W/10 TON CRANE	Diesel	350	5	138	1	1	5	690
3 AXL FLATBED W/12+ TON CRANE	Diesel	350	5	138	1	1	5	690
900 AIR COMPRESSOR-IR	Diesel	275	10	138	2	2	20	2,760
3" PUMP MQ	Gas	4	10	138	4	4	40	5,520

Auger Bore Crew

EQUIPMENT DESCRIPTION	Fuel Type	Engine Rating per Unit (hp)	Daily Operation per Unit (hr/day)	Total Working Days per Unit	No. of Units		Total Daily Operation of All Units (hr/day)	Total Overall Operation of All Units (hr)
					Boring	TOTAL		
3 AXL FLATBED W/12+ TON CRANE	Diesel	350	5	138	1	1	5	690
3 AXL LOWBED TRACTOR & TRAILER	Diesel	350	5	138	1	1	5	690
325BL EXCAVATOR-CAT	Diesel	188	7.5	138	1	1	7.5	1,035
RT-630 CRANE-GROVE	Diesel	160	5	138	1	1	5	690
SA250 WELD MACHINE-LINCOLN	Diesel	40	7.5	138	1	1	7.5	1,035
G115KW GENERATOR-IR	Diesel	125	10	138	2	2	20	2,760
3" PUMP MQ	Gas	4	10	138	2	2	20	2,760
AUGER BORE MACHINE	Diesel	106	10	138	1	1	10	1,380

Table 16
Non-Road Equipment - HDD Crews and Station Crews
Calnev Expansion Project

HDD Crew Nos. 1, 2, and 3 (Data Listed are for Each Crew)

EQUIPMENT DESCRIPTION	Fuel Type	Engine Rating per Unit (hp)	Daily Operation per Unit (hr/day)	Total Working Days per Unit	No. of Units			Total Daily Operation of All Units (hr/day)	Total Overall Operation of All Units (hr)
					Drilling	Pipe Pull	TOTAL		
FORKLIFT, 8000+ LBS	Diesel	110	5	168	1	2	3	15	2,520
330BL EXCAVATOR-CAT	Diesel	204	7.5	138	1	2	3	22.5	3,105
580SL BACKHOE-CASE	Diesel	110	7.5	138	1	2	3	22.5	3,105
RT-860B CRANE-GROVE	Diesel	190	5	138	1	2	3	15	2,070
SAM 400 WELDER-LINCOLN	Diesel	57	7.5	138	2	1	3	22.5	3,105
G260KW GENERATOR-IR	Diesel	310	10	138	2		2	20	2,760
LIGHT TOWERS	Diesel	13	10	138	4	4	8	80	11,040
750,000 # DRILL RIG (2 3408 E ENG)	Diesel	1150	10	138	1		1	10	1,380
MUD TANK CLEANING SYST. INCL. PUMPS	Diesel	750	10	138	1		1	10	1,380
150,000 # DRILL RIG	Diesel	300	10	138	1		1	10	1,380
MUD TANK CLEANING SYST. INCL. PUMPS	Diesel	460	10	138	1		1	10	1,380
80,000 # DRILL RIG	Diesel	200	10	138	1		1	10	1,380
MUD TANK CLEANING SYST. INCL. PUMPS	Diesel	87	10	138	1		1	10	1,380

Station Crew Nos. 1 and 2 (Data Listed are for Each Crew)

EQUIPMENT DESCRIPTION	Fuel Type	Engine Rating per Unit (hp)	Daily Operation per Unit (hr/day)	Total Working Days per Unit	No. of Units				Total Daily Operation of All Units (hr/day)	Total Overall Operation of All Units (hr)	
					Excavation Work	Welding & Fabrication	Piping & Equip Installation	Backfilling & Cleanup			
3 AXL FLATBED W/12+ TON CRANE	Diesel	350	5	72		1	1		2	10	720
3 AXL DUMP TRUCK 10 C.Y.	Diesel	350	5	72	4			2	6	30	2,160
330BL EXCAVATOR-CAT	Diesel	204	7.5	72	1			1	2	15	1,080
430D BACKHOE-CAT	Diesel	102	7.5	72	1			1	2	15	1,080
914G WHEEL LOADER-CAT	Diesel	90	2.5	72	1			1	2	5	360
RT-518 CRANE-GROVE	Diesel	110	5	72		1			1	5	360
RT-630 CRANE-GROVE	Diesel	160	5	72			1		1	5	360
RT-860B CRANE-GROVE	Diesel	190	5	72			1		1	5	360
P185 WD AIR COMPRESSOR-IR	Diesel	78	5	72	2		1	3	6	30	2,160
1500 AIR COMPRESSOR-IR	Diesel	460	10	72				1	1	10	720
SA250 WELD MACHINE-LINCOLN	Diesel	40	7.5	72		6	4		10	75	5,400

Table 17
Non-Road Equipment Exhaust Emission Factors
Calnev Expansion Project

Equipment	Maximum Operating Range (hp)	Emission Factor (lb/hr)						
		VOC	CO	NOX	SOX	PM	CO2	CH4
Aerial Lifts	15	0.0103	0.0528	0.0650	0.0001	0.0033	8.7	0.0009
	25	0.0192	0.0546	0.0984	0.0001	0.0060	11.0	0.0017
	50	0.0706	0.1884	0.1952	0.0003	0.0179	19.6	0.0064
	120	0.0657	0.2477	0.4270	0.0004	0.0346	38.1	0.0059
	500	0.1378	0.5300	1.7852	0.0021	0.0540	213	0.0124
	750	0.2567	0.9581	3.3162	0.0039	0.0991	385	0.0232
		0.0624	0.2033	0.3429	0.0004	0.0235	34.7	0.0056
Aerial Lifts Composite								
Air Compressors	15	0.0137	0.0504	0.0805	0.0001	0.0057	7.2	0.0012
	25	0.0306	0.0814	0.1368	0.0002	0.0093	14.4	0.0028
	50	0.1093	0.2740	0.2350	0.0003	0.0253	22.3	0.0099
	120	0.0956	0.3321	0.5677	0.0006	0.0524	47.0	0.0086
	175	0.1209	0.5096	0.9549	0.0010	0.0548	88.5	0.0109
	250	0.1136	0.3192	1.3087	0.0015	0.0416	131	0.0103
	500	0.1811	0.6166	2.0558	0.0023	0.0682	232	0.0163
	750	0.2844	0.9529	3.2673	0.0036	0.1071	358	0.0257
	1000	0.4881	1.7108	5.7297	0.0049	0.1705	486	0.0440
Air Compressors Composite		0.1054	0.3524	0.6923	0.0007	0.0501	63.6	0.0095
Bore/Drill Rigs								
Bore/Drill Rigs	15	0.0120	0.0632	0.0754	0.0002	0.0029	10.3	0.0011
	25	0.0195	0.0658	0.1242	0.0002	0.0059	16.0	0.0018
	50	0.0436	0.2409	0.2790	0.0004	0.0169	31.0	0.0039
	120	0.0606	0.4762	0.5580	0.0009	0.0400	77.1	0.0055
	175	0.0829	0.7539	0.8250	0.0016	0.0446	141	0.0075
	250	0.0892	0.3445	1.0129	0.0021	0.0323	188	0.0081
	500	0.1418	0.5542	1.4912	0.0031	0.0521	311	0.0128
	750	0.2822	1.0947	3.0008	0.0062	0.1034	615	0.0255
	1000	0.4882	1.6903	7.3893	0.0093	0.1875	928	0.0440
Bore/Drill Rigs Composite		0.0943	0.5102	1.0083	0.0017	0.0436	165	0.0085
Cement and Mortar Mixers								
Cement and Mortar Mixers	15	0.0076	0.0387	0.0484	0.0001	0.0026	6.3	0.0007
	25	0.0319	0.0895	0.1589	0.0002	0.0099	17.6	0.0029
Cement and Mortar Mixers Composite		0.0096	0.0429	0.0575	0.0001	0.0032	7.2	0.0009
Concrete/Industrial Saws								
Concrete/Industrial Saws	25	0.0200	0.0678	0.1268	0.0002	0.0056	16.5	0.0018
	50	0.1139	0.3112	0.3019	0.0004	0.0284	30.2	0.0103
	120	0.1247	0.4926	0.8118	0.0009	0.0684	74.1	0.0113
	175	0.1805	0.8751	1.5479	0.0018	0.0826	160	0.0163
Concrete/Industrial Saws Composite		0.1179	0.4209	0.6240	0.0007	0.0525	58.5	0.0106
Cranes								
Cranes	50	0.1192	0.3071	0.2511	0.0003	0.0273	23.2	0.0108
	120	0.1048	0.3686	0.6196	0.0006	0.0571	50.1	0.0095
	175	0.1149	0.4857	0.8777	0.0009	0.0514	80.3	0.0104
	250	0.1171	0.3276	1.1522	0.0013	0.0428	112	0.0106
	500	0.1726	0.6137	1.6493	0.0018	0.0627	180	0.0156
	750	0.2920	1.0299	2.8472	0.0030	0.1068	303	0.0263
	9999	1.0371	3.8402	11.5554	0.0098	0.3585	971	0.0936
Cranes Composite		0.1507	0.5179	1.3617	0.0014	0.0599	129	0.0136
Crawler Tractors								
Crawler Tractors	50	0.1352	0.3424	0.2745	0.0003	0.0305	24.9	0.0122
	120	0.1461	0.4959	0.8580	0.0008	0.0778	65.8	0.0132
	175	0.1848	0.7540	1.4007	0.0014	0.0818	121	0.0167
	250	0.1950	0.5472	1.8209	0.0019	0.0725	166	0.0176
	500	0.2783	1.1025	2.5536	0.0025	0.1020	259	0.0251
	750	0.5006	1.9682	4.6762	0.0047	0.1844	465	0.0452
	1000	0.7588	3.1215	8.1716	0.0066	0.2653	658	0.0685
Crawler Tractors Composite		0.1764	0.6220	1.3069	0.0013	0.0806	114	0.0159
Crushing/Proc. Equipment								
Crushing/Proc. Equipment	50	0.2109	0.5418	0.4626	0.0006	0.0493	44.0	0.0190
	120	0.1647	0.5896	0.9809	0.0010	0.0915	83.1	0.0149
	175	0.2234	0.9697	1.7520	0.0019	0.1023	167	0.0202
	250	0.2081	0.5837	2.3660	0.0028	0.0754	245	0.0188
	500	0.2887	0.9617	3.1941	0.0037	0.1071	374	0.0261
	750	0.4624	1.4856	5.2437	0.0059	0.1718	589	0.0417
	9999	1.2993	4.4184	15.2096	0.0131	0.4525	1,308	0.1172

Table 17
Non-Road Equipment Exhaust Emission Factors
Calnev Expansion Project

Equipment	Maximum Operating Range (hp)	Emission Factor (lb/hr)						
		VOC	CO	NOX	SOX	PM	CO2	CH4
Crushing/Proc. Equipment Composite		0.2014	0.7073	1.3534	0.0015	0.0884	132	0.0182
Dumpers/Tenders	25	0.0103	0.0330	0.0629	0.0001	0.0034	7.6	0.0009
Dumpers/Tenders Composite		0.0103	0.0330	0.0629	0.0001	0.0034	7.6	0.0009
Excavators	25	0.0198	0.0677	0.1255	0.0002	0.0050	16.4	0.0018
	50	0.0108	0.3035	0.2601	0.0003	0.0256	25.0	0.0092
	120	0.1287	0.5267	0.7851	0.0009	0.0725	73.6	0.0116
	175	0.1375	0.6689	1.0363	0.0013	0.0627	112	0.0124
	250	0.1371	0.3762	1.3632	0.0018	0.0465	159	0.0124
	500	0.1893	0.5792	1.7621	0.0023	0.0639	234	0.0170
	750	0.3154	0.9588	3.0187	0.0039	0.1078	387	0.0285
Excavators Composite		0.1388	0.5482	1.0634	0.0013	0.0592	120	0.0125
Forklifts	50	0.0588	0.1749	0.1507	0.0002	0.0149	14.7	0.0053
	120	0.0545	0.2218	0.3262	0.0004	0.0312	31.2	0.0049
	175	0.0681	0.3304	0.5104	0.0006	0.0313	56.1	0.0061
	250	0.0622	0.1667	0.6508	0.0009	0.0207	77.1	0.0056
	500	0.0836	0.2280	0.8064	0.0011	0.0279	111	0.0075
Forklifts Composite		0.0635	0.2284	0.4742	0.0006	0.0257	54.4	0.0057
Generator Sets	15	0.0165	0.0712	0.1110	0.0002	0.0065	10.2	0.0015
	25	0.0287	0.0994	0.1670	0.0002	0.0102	17.6	0.0026
	50	0.1043	0.2826	0.3020	0.0004	0.0270	30.6	0.0094
	120	0.1305	0.5007	0.8616	0.0009	0.0684	77.9	0.0118
	175	0.1572	0.7442	1.3995	0.0016	0.0694	142	0.0142
	250	0.1483	0.4702	1.9373	0.0024	0.0558	213	0.0134
	500	0.2109	0.8134	2.7911	0.0033	0.0830	337	0.0190
	750	0.3517	1.3131	4.6299	0.0055	0.1361	544	0.0317
	9999	0.9398	3.3349	11.5379	0.0105	0.3364	1,049	0.0848
Generator Sets Composite		0.0898	0.3204	0.6121	0.0007	0.0376	61.0	0.0081
Graders	50	0.1290	0.3473	0.2920	0.0004	0.0304	27.5	0.0116
	120	0.1449	0.5405	0.8750	0.0009	0.0801	75.0	0.0131
	175	0.1647	0.7384	1.2722	0.0014	0.0745	124	0.0149
	250	0.1664	0.4709	1.6586	0.0019	0.0603	172	0.0150
	500	0.2045	0.7048	1.9645	0.0023	0.0737	229	0.0185
	750	0.4357	1.4881	4.2746	0.0049	0.1581	486	0.0393
Graders Composite		0.1626	0.6216	1.3404	0.0015	0.0707	133	0.0147
Off-Highway Tractors	120	0.2339	0.7351	1.3587	0.0011	0.1204	93.7	0.0211
	175	0.2229	0.8479	1.6869	0.0015	0.0975	130	0.0201
	250	0.1797	0.5115	1.6148	0.0015	0.0689	130	0.0162
	750	0.7101	3.3111	6.4854	0.0057	0.2682	568	0.0641
	1000	1.0705	5.1530	10.9774	0.0082	0.3811	814	0.0966
Off-Highway Tractors Composite		0.2267	0.8123	1.8919	0.0017	0.0926	151	0.0205
Off-Highway Trucks	175	0.1630	0.7608	1.1915	0.0014	0.0730	125	0.0147
	250	0.1550	0.4101	1.4773	0.0019	0.0515	167	0.0140
	500	0.2372	0.7058	2.1240	0.0027	0.0785	272	0.0214
	750	0.3873	1.1432	3.5575	0.0044	0.1295	442	0.0349
	1000	0.6108	1.9159	6.8506	0.0063	0.2074	625	0.0551
Off-Highway Trucks Composite		0.2355	0.6994	2.1941	0.0027	0.0792	260	0.0212
Other Construction Equipment	15	0.0118	0.0617	0.0737	0.0002	0.0029	10.1	0.0011
	25	0.0161	0.0544	0.1027	0.0002	0.0049	13.2	0.0015
	50	0.0935	0.2833	0.2745	0.0004	0.0245	28.0	0.0084
	120	0.1209	0.5367	0.8097	0.0009	0.0694	80.9	0.0109
	175	0.1086	0.5889	0.9253	0.0012	0.0515	107	0.0098
	500	0.1596	0.5683	1.8098	0.0025	0.0605	254	0.0144
Other Construction Equipment Composite		0.0984	0.3954	0.9321	0.0013	0.0404	123	0.0089
Other General Industrial Equipment	15	0.0066	0.0391	0.0466	0.0001	0.0018	6.4	0.0006
	25	0.0185	0.0632	0.1172	0.0002	0.0047	15.3	0.0017
	50	0.1188	0.2972	0.2375	0.0003	0.0270	21.7	0.0107
	120	0.1371	0.4597	0.7774	0.0007	0.0755	62.0	0.0124
	175	0.1437	0.5788	1.0710	0.0011	0.0646	95.9	0.0130
	250	0.1307	0.3434	1.3989	0.0015	0.0458	136	0.0118
	500	0.2349	0.7297	2.4165	0.0026	0.0832	265	0.0212
	750	0.3901	1.2027	4.1009	0.0044	0.1394	437	0.0352
	1000	0.6008	2.0244	6.7928	0.0056	0.2087	560	0.0542
Other General Industrial Equipment Composite		0.1737	0.5618	1.5591	0.0016	0.0686	152	0.0157
Other Material Handling Equipment	50	0.1648	0.4110	0.3302	0.0004	0.0375	30.3	0.0149
	120	0.1332	0.4476	0.7585	0.0007	0.0735	60.7	0.0120
	175	0.1814	0.7331	1.3603	0.0014	0.0818	122	0.0164

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Table 17
Non-Road Equipment Exhaust Emission Factors
Calnev Expansion Project

Equipment	Maximum Operating Range (hp)	Emission Factor (lb/hr)						
		VOC	CO	NOX	SOX	PM	CO2	CH4
	250	0.1382	0.3659	1.4933	0.0016	0.0488	145	0.0125
	500	0.1674	0.5255	1.7416	0.0019	0.0597	192	0.0151
	9999	0.7937	2.6766	8.9765	0.0073	0.2749	741	0.0716
Other Material Handling Equipment Composite		0.1666	0.5304	1.5148	0.0015	0.0665	141	0.0150
Pavers	25	0.0265	0.0827	0.1565	0.0002	0.0086	18.7	0.0024
	50	0.1538	0.3769	0.3073	0.0004	0.0342	28.0	0.0139
	120	0.1551	0.5163	0.9242	0.0008	0.0819	69.2	0.0140
	175	0.1955	0.7892	1.5256	0.0014	0.0869	128	0.0176
	250	0.2300	0.6675	2.1988	0.0022	0.0884	194	0.0208
	500	0.2498	1.0760	2.3832	0.0023	0.0952	233	0.0225
Pavers Composite		0.1684	0.5541	0.9421	0.0009	0.0679	77.9	0.0152
Paving Equipment	25	0.0154	0.0520	0.0981	0.0002	0.0046	12.6	0.0014
	50	0.1311	0.3200	0.2622	0.0003	0.0291	23.9	0.0118
	120	0.1215	0.4038	0.7249	0.0006	0.0642	54.5	0.0110
	175	0.1526	0.6157	1.1976	0.0011	0.0678	101	0.0138
	250	0.1425	0.4146	1.3779	0.0014	0.0548	122	0.0129
Paving Equipment Composite		0.1269	0.4418	0.8536	0.0008	0.0603	68.9	0.0114
Plate Compactors	15	0.0050	0.0263	0.0315	0.0001	0.0013	4.3	0.0005
Plate Compactors Composite		0.0050	0.0263	0.0315	0.0001	0.0013	4.3	0.0005
Pressure Washers	15	0.0079	0.0341	0.0532	0.0001	0.0031	4.9	0.0007
	25	0.0116	0.0403	0.0677	0.0001	0.0041	7.1	0.0011
	50	0.0383	0.1110	0.1364	0.0002	0.0109	14.3	0.0035
	120	0.0361	0.1472	0.2538	0.0003	0.0184	24.1	0.0033
Pressure Washers Composite		0.0186	0.0652	0.0956	0.0001	0.0067	9.4	0.0017
Pumps	15	0.0141	0.0518	0.0827	0.0001	0.0058	7.4	0.0013
	25	0.0413	0.1098	0.1845	0.0002	0.0125	19.5	0.0037
	50	0.1253	0.3338	0.3424	0.0004	0.0317	34.3	0.0113
	120	0.1350	0.5088	0.8751	0.0009	0.0714	77.9	0.0122
	175	0.1609	0.7461	1.4030	0.0016	0.0714	140	0.0145
	250	0.1463	0.4539	1.8649	0.0023	0.0550	201	0.0132
	500	0.2249	0.8612	2.8947	0.0034	0.0881	345	0.0203
	750	0.3829	1.4237	4.9177	0.0057	0.1479	571	0.0346
	9999	1.2391	4.4349	15.0785	0.0136	0.4418	1,355	0.1118
Pumps Composite		0.0877	0.3040	0.5285	0.0006	0.0375	49.6	0.0079
Rollers	15	0.0074	0.0386	0.0461	0.0001	0.0018	6.3	0.0007
	25	0.0162	0.0549	0.1037	0.0002	0.0049	13.3	0.0015
	50	0.1186	0.3080	0.2714	0.0003	0.0278	26.0	0.0107
	120	0.1126	0.4136	0.7005	0.0007	0.0612	59.0	0.0102
	175	0.1398	0.6243	1.1369	0.0012	0.0633	108	0.0126
	250	0.1441	0.4301	1.5140	0.0017	0.0549	153	0.0130
	500	0.1866	0.7240	1.9447	0.0022	0.0716	219	0.0168
Rollers Composite		0.1106	0.4157	0.7342	0.0008	0.0521	67.1	0.0100
Rough Terrain Forklifts	50	0.1452	0.4046	0.3504	0.0004	0.0354	33.9	0.0131
	120	0.1124	0.4404	0.6880	0.0007	0.0636	62.4	0.0101
	175	0.1541	0.7283	1.2033	0.0014	0.0711	125	0.0139
	250	0.1425	0.4036	1.5294	0.0019	0.0506	171	0.0129
	500	0.1978	0.6345	2.0183	0.0025	0.0708	257	0.0178
Rough Terrain Forklifts Composite		0.1181	0.4721	0.7494	0.0008	0.0638	70.3	0.0107
Rubber Tired Dozers	175	0.2302	0.8604	1.7086	0.0015	0.0998	129	0.0208
	250	0.2659	0.7432	2.3209	0.0021	0.1006	183	0.0240
	500	0.3481	1.6282	3.0411	0.0026	0.1286	265	0.0314
	750	0.5247	2.4391	4.6508	0.0040	0.1951	399	0.0473
	1000	0.8129	3.9143	8.1253	0.0060	0.2871	592	0.0733
Rubber Tired Dozers Composite		0.3244	1.3284	2.8346	0.0025	0.1212	239	0.0293
Rubber Tired Loaders	25	0.0205	0.0697	0.1302	0.0002	0.0058	16.9	0.0019
	50	0.1436	0.3878	0.3286	0.0004	0.0340	31.1	0.0130
	120	0.1124	0.4226	0.6818	0.0007	0.0623	58.9	0.0101
	175	0.1392	0.6305	1.0816	0.0012	0.0633	106	0.0126
	250	0.1408	0.4012	1.4208	0.0017	0.0511	149	0.0127
	500	0.2063	0.7168	2.0063	0.0023	0.0746	237	0.0186
	750	0.4255	1.4649	4.2274	0.0049	0.1550	486	0.0384
	1000	0.5801	2.0836	6.7240	0.0060	0.2029	594	0.0523
Rubber Tired Loaders Composite		0.1354	0.4959	1.0771	0.0012	0.0608	109	0.0122
Scrapers	120	0.2111	0.7087	1.2393	0.0011	0.1122	93.9	0.0190
	175	0.2280	0.9219	1.7346	0.0017	0.1009	148	0.0206
	250	0.2489	0.7019	2.3295	0.0024	0.0931	209	0.0225

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Table 17
Non-Road Equipment Exhaust Emission Factors
Calnev Expansion Project

Equipment	Maximum Operating Range (hp)	Emission Factor (lb/hr)						
		VOC	CO	NOX	SOX	PM	CO2	CH4
	500	0.3488	1.4023	3.2148	0.0032	0.1286	321	0.0315
	750	0.6046	2.4131	5.6704	0.0056	0.2240	555	0.0546
Scrapers Composite		0.3055	1.1660	2.7336	0.0027	0.1172	262	0.0276
Signal Boards	15	0.0072	0.0377	0.0450	0.0001	0.0017	6.2	0.0006
	50	0.1387	0.3716	0.3629	0.0005	0.0345	36.2	0.0125
	120	0.1393	0.5327	0.8930	0.0009	0.0755	80.2	0.0126
	175	0.1789	0.8404	1.5271	0.0017	0.0811	155	0.0161
	250	0.1881	0.5757	2.3319	0.0029	0.0707	255	0.0170
Signal Boards Composite		0.0214	0.0946	0.1545	0.0002	0.0087	16.7	0.0019
Skid Steer Loaders	25	0.0229	0.0666	0.1219	0.0002	0.0073	13.8	0.0021
	50	0.0684	0.2411	0.2428	0.0003	0.0198	25.5	0.0062
	120	0.0542	0.2794	0.3835	0.0005	0.0325	42.8	0.0049
Skid Steer Loaders Composite		0.0609	0.2418	0.2800	0.0004	0.0230	30.3	0.0055
Surfacing Equipment	50	0.0551	0.1480	0.1430	0.0002	0.0135	14.1	0.0050
	120	0.1114	0.4291	0.7292	0.0007	0.0595	63.8	0.0101
	175	0.1009	0.4764	0.8677	0.0010	0.0453	85.8	0.0091
	250	0.1172	0.3696	1.2861	0.0015	0.0453	135	0.0106
	500	0.1738	0.7265	1.9125	0.0022	0.0680	221	0.0157
	750	0.2774	1.1362	3.0719	0.0035	0.1077	347	0.0250
Surfacing Equipment Composite		0.1453	0.5792	1.4651	0.0017	0.0558	166	0.0131
Sweepers/Scrubbers	15	0.0124	0.0729	0.0870	0.0002	0.0033	11.9	0.0011
	25	0.0238	0.0808	0.1510	0.0002	0.0067	19.6	0.0021
	50	0.1345	0.3714	0.3228	0.0004	0.0328	31.6	0.0121
	120	0.1362	0.5266	0.8095	0.0009	0.0782	75.0	0.0123
	175	0.1715	0.8026	1.3252	0.0016	0.0793	139	0.0155
	250	0.1271	0.3535	1.4297	0.0018	0.0445	162	0.0115
Sweepers/Scrubbers Composite		0.1411	0.5292	0.7939	0.0009	0.0637	78.5	0.0127
Tractors/Loaders/Backhoes	25	0.0205	0.0670	0.1281	0.0002	0.0066	15.9	0.0019
	50	0.1127	0.3422	0.3070	0.0004	0.0289	30.3	0.0102
	120	0.0833	0.3589	0.5288	0.0006	0.0478	51.7	0.0075
	175	0.1135	0.5873	0.8955	0.0011	0.0530	101	0.0102
	250	0.1336	0.3879	1.4091	0.0019	0.0467	172	0.0121
	500	0.2500	0.8065	2.4813	0.0039	0.0877	345	0.0226
	750	0.3785	1.2085	3.8514	0.0058	0.1341	517	0.0342
Tractors/Loaders/Backhoes Composite		0.0938	0.3874	0.6276	0.0008	0.0482	66.8	0.0085
Trenchers	15	0.0099	0.0517	0.0617	0.0001	0.0023	8.5	0.0009
	25	0.0399	0.1355	0.2532	0.0004	0.0112	32.9	0.0036
	50	0.1746	0.4270	0.3577	0.0004	0.0389	32.9	0.0158
	120	0.1430	0.4784	0.8672	0.0008	0.0746	64.9	0.0129
	175	0.2150	0.8764	1.7133	0.0016	0.0954	144	0.0194
	250	0.2622	0.7775	2.5293	0.0025	0.1025	223	0.0237
	500	0.3295	1.5125	3.2067	0.0031	0.1280	311	0.0297
	750	0.6256	2.8386	6.1534	0.0059	0.2427	587	0.0565
Trenchers Composite		0.1590	0.4826	0.7297	0.0007	0.0612	58.7	0.0143
Welders	15	0.0118	0.0433	0.0692	0.0001	0.0049	6.2	0.0011
	25	0.0239	0.0636	0.1069	0.0001	0.0073	11.3	0.0022
	50	0.1157	0.2949	0.2683	0.0003	0.0275	26.0	0.0104
	120	0.0760	0.2714	0.4654	0.0005	0.0412	39.5	0.0069
	175	0.1263	0.5496	1.0324	0.0011	0.0569	98.2	0.0114
	250	0.0973	0.2828	1.1575	0.0013	0.0361	119	0.0088
	500	0.1230	0.4387	1.4583	0.0016	0.0472	168	0.0111
Welders Composite		0.0758	0.2203	0.2818	0.0003	0.0258	25.6	0.0068

Source: SCAQMD emission factors file name "offroadEF_0725.xls" Year: 2011.

Table 18
Emissions for Non-Road Equipment - Mainline Spread Nos. 1 and 2
Calnev Expansion Project

(Emissions Listed are for Each Spread)

Equipment Type	Fuel Type	Equipment Engine Size (hp)	Total Daily Operation of All Units (hr/day)	Total Hourly usage (hrs)	Daily Emissions (lbs/day)							Total Emissions (tons)							Total Emissions (metric tons)		Emission Factor Reference	
					VOC	CO	NO _x	SO ₂	PM	CO ₂	CH ₄	VOC	CO	NO _x	SO ₂	PM	CO ₂	CH ₄	Equipment Type	Size		
FORKLIFT, 8000+ LBS	Diesel	110	10	1980	0.5	2.2	3.3	0.004	0.3	312	0.05	0.05	0.22	0.3	0.0004	0.03	28	0.004	Forklifts	Max. hp 120		
D8N DOZER W/WINCH(HYSTER)-CAT	Diesel	310	60	10080	21	97.7	182	0.156	7.7	15,892	1.88	1.75	8.21	15	0.013	0.65	1,211	0.144	Rubber tired Dozers	Max. hp 500		
571G PIPELAYER-CAT	Diesel	200	50	8400	9.7	27.4	91.0	0.093	3.6	8,307	0.88	0.82	2.30	7.6	0.008	0.30	633	0.067	Crawler Tractors	Max. hp 250		
572G PIPELAYER-CAT	Diesel	180	50	8400	9.7	27.4	91.0	0.093	3.6	8,307	0.88	0.82	2.30	7.6	0.008	0.30	633	0.067	Crawler Tractors	Max. hp 250		
TRENCHING MACHINE	Diesel	185	15	2520	3.9	11.7	37.9	0.038	1.5	3,344	0.35	0.33	0.98	3.2	0.003	0.13	255	0.027	Trenchers	Max. hp 250		
315CL EXCAVATOR-CAT W/COMP. WHEEL	Diesel	115	23	3780	2.9	11.9	17.7	0.019	1.6	1,657	0.26	0.24	1.00	1.5	0.002	0.14	126	0.020	Excavators	Max. hp 120		
325BL EXCAVATOR-CAT	Diesel	188	45	7560	6.2	16.9	61.3	0.080	2.1	7,141	0.56	0.52	1.42	5.2	0.007	0.18	544	0.042	Excavators	Max. hp 250		
330BL EXCAVATOR-CAT	Diesel	204	30	5040	4.1	11.3	40.9	0.054	1.4	4,760	0.37	0.35	0.95	3.4	0.004	0.12	363	0.028	Excavators	Max. hp 250		
330BL EXCAVATOR/AUX HYD-HAMMER-CAT	Diesel	204	23	3780	3.1	17.5	56.9	0.056	2.3	5,015	0.53	0.50	1.47	4.8	0.005	0.19	382	0.041	Excavators	Max. hp 250		
16-30 BENDING MACHINE-CRC	Diesel	100	5	840	0.6	2.7	4.0	0.005	0.3	404	0.05	0.05	0.23	0.3	0.000	0.03	31	0.004	Other Construction Equipment	Max. hp 120		
590SL BACKHOE 4WD-CASE	Diesel	110	45	7560	3.7	16.1	23.8	0.027	2.2	2,328	0.34	0.31	1.36	2.0	0.002	0.18	177	0.026	Tractors/Loaders/Backhoes	Max. hp 120		
RD90B READSCREEN	Diesel	42	10	1680	0.9	2.8	2.7	0.004	0.2	280	0.08	0.08	0.24	0.2	0.000	0.02	21	0.006	Other Construction Equipment	Max. hp 50		
OWZIE PADDER	Diesel	325	15	2520	2.4	8.5	27.1	0.037	0.9	3,814	0.22	0.20	0.72	2.3	0.003	0.08	291	0.016	Other Construction Equipment	Max. hp 500		
950G WHEEL LOADER 4YD-CAT	Diesel	197	30	5040	4.2	12.0	42.6	0.050	1.5	4,469	0.4	0.35	1.01	3.6	0.004	0.13	341	0.029	Rubber Tired Loaders	Max. hp 250		
12G MOTOR GRADER-CAT	Diesel	135	23	3780	3.7	16.6	28.6	0.031	1.7	2,788	0.33	0.31	1.40	2.4	0.003	0.14	212	0.025	Graders	Max. hp 175		
14G MOTOR GRADER-CAT	Diesel	150	23	3780	3.7	16.6	28.6	0.031	1.7	2,788	0.33	0.31	1.40	2.4	0.003	0.14	212	0.025	Graders	Max. hp 175		
RT-518 CRANE-GROVE	Diesel	110	5	840	0.5	1.8	3.1	0.003	0.3	251	0.05	0.04	0.15	0.3	0.0002	0.02	19	0.004	Cranes	Max. hp 120		
RT-630 CRANE-GROVE	Diesel	160	5	840	0.6	2.4	4.4	0.005	0.3	402	0.05	0.05	0.20	0.37	0.0004	0.02	31	0.004	Cranes	Max. hp 175		
390 AIR COMPRESSOR-QUINCY	Diesel	37	10	1680	1.1	2.7	2.4	0.003	0.3	223	0.10	0.09	0.23	0.20	0.0002	0.02	17	0.008	Air Compressors	Max. hp. 50		
1500 AIR COMPRESSOR-IR	Diesel	460	20	3360	3.6	12.3	41.1	0.045	1.4	4,635	0.33	0.30	1.04	3.5	0.004	0.11	353	0.025	Air Compressors	Max. hp. 500		
SA250 WELD MACHINE-LINCOLN	Diesel	40	150	25200	17.4	44.2	40.2	0.050	4.1	3,894	1.57	1.46	3.72	3.4	0.004	0.35	297	0.119	Welders	Max. hp. 50		
60kW GENERATOR-IR	Diesel	72	60	10080	7.8	30.0	51.7	0.055	4.1	4,677	0.71	0.66	2.52	4.3	0.005	0.34	356	0.054	Generators	Max. hp. 120		
100kW GENERATOR-COLEMAN	Diesel	110	60	10080	7.8	30.0	51.7	0.055	4.1	4,677	0.71	0.66	2.52	4.3	0.005	0.34	356	0.054	Generators	Max. hp. 120		
G260kW GENERATOR-IR	Diesel	310	60	10080	12.7	48.8	167.5	0.198	5.0	20,211	1.14	1.06	4.10	14.1	0.017	0.42	1,540	0.087	Generators	Max. hp. 500		
FT83 TEST/FILL PUMP-SABRE	Diesel	181	20	3360	2.9	9.1	37.3	0.045	1.1	4,027	0.26	0.25	0.76	3.1	0.004	0.09	307	0.020	Pumps	Max. hp 250		
3" PUMP MQ	Gas	4	40	6720	0.6	2.1	3.3	0.005	0.2	297	0.05	0.05	0.17	0.3	0.0004	0.02	23	0.004	Pumps	Max. hp 15		
CD150M 6" PUMP-GODWIN	Diesel	90	60	10080	8.1	30.5	52.5	0.055	4.3	4,677	0.73	0.68	2.56	4.4	0.005	0.36	356	0.056	Pumps	Max. hp 120		
TOTAL					144	513	1195	1.3	58	119,576	13	12	43	100	0.11	4.9	9,116	1.0	-	-		

Table 19
Emissions for Non-Road Equipment - Street Work Spread Nos. 1, 2, and 3
(Emissions Listed are for Each Spread)
Calnev Expansion Project

Equipment Type	Fuel Type	Equipment Engine Size (hp)	Total Daily Operation of All Units (hr/day)	Total Hourly usage (hrs)	Daily Emissions (lbs/day)							Total Emissions (tons)							Equipment Factor Reference	Size
					VOC	CO	NO _x	SO ₂	PM	CO ₂	CH ₄	VOC	CO	NO _x	SO ₂	PM	CO ₂	CH ₄		
2 TON FLATBED W/10 TON CRANE	Diesel	350	4	672	0.7	2.5	6.6	0.007	0.3	720.4	0.06	0.058	0.21	0.55	0.0006	0.021	55	0.0047	Cranes	Max. hp 500
3 AXL FLATBED W/12+ TON CRANE	Diesel	350	4	672	0.7	2.5	6.6	0.0	0.3	720.4	0.1	0.058	0.206	0.554	0.001	0.021	55	0.0047	Cranes	Max. hp 500
FORKLIFT, 8000+ LBS	Diesel	110	4	792	0.2	0.9	1.3	0.001	0.1	124.9	0.02	0.022	0.09	0.13	0.0001	0.012	11	0.0018	Forklifts	Max. hp 120
571G PIPELAYER-CAT	Diesel	310	12	2,016	3.3	13.2	30.6	0.031	1.2	3110.8	0.30	0.281	1.11	2.57	0.0026	0.103	237	0.0230	Crawler Tractors	Max. hp 500
572G PIPELAYER-CAT	Diesel	200	8	1,344	1.6	4.4	14.6	0.015	0.6	1329.1	0.14	0.131	0.37	1.22	0.0013	0.049	101	0.0107	Crawler Tractors	Max. hp 250
TRENCHING MACHINE	Diesel	180	4	672	1.0	3.1	10.1	0.0	0.4	891.6	0.1	0.088	0.261	0.85	0.001	0.034	68	0.0072	Trenchers	Max. hp 250
315CL EXCAVATOR-CAT W/COMP. WHEEL	Diesel	115	6	1,008	0.8	3.2	4.7	0.005	0.4	441.7	0.07	0.065	0.27	0.40	0.0004	0.037	34	0.0053	Excavators	Max. hp 120
330BL EXCAVATOR-CAT	Diesel	204	12	2,016	1.6	4.5	16.4	0.021	0.6	1,904	0.15	0.138	0.38	1.4	0.0018	0.047	145	0.0113	Excavators	Max. hp 250
16-30 BENDING MACHINE-CRC	Diesel	100	2	336	0.2	1.1	1.6	0.002	0.1	161.7	0.02	0.020	0.09	0.14	0.0002	0.012	12	0.0017	Other Construction Equipment	Max. hp 120
420D BACKHOE-CAT	Diesel	93	6	1,008	0.5	2.2	3.2	0.004	0.3	310.4	0.05	0.042	0.18	0.27	0.0003	0.024	24	0.0034	Tractors/Loaders/Backhoes	Max. hp 120
430D BACKHOE-CAT	Diesel	102	6	1,008	0.5	2.2	3.2	0.004	0.3	310	0.05	0.042	0.18	0.3	0.0003	0.024	24	0.0034	Tractors/Loaders/Backhoes	Max. hp 120
OZZIE PADDER	Diesel	325	6	1,008	1.0	3.4	10.9	0.015	0.4	1525.4	0.1	0.080	0.286	0.91	0.001	0.031	116	0.0066	Other Construction Equipment	Max. hp 500
936E WHEEL LOADER 3YD-CAT	Diesel	140	6	1,008	0.8	3.8	6.5	0.007	0.4	637.9	0.08	0.070	0.32	0.55	0.0006	0.032	49	0.0057	Rubber Tired Loaders	Max. hp 175
950G WHEEL LOADER 4YD-CAT	Diesel	197	6	1,008	0.8	2.4	8.5	0.010	0.3	893.9	0.08	0.071	0.20	0.72	0.0008	0.026	68	0.0058	Rubber Tired Loaders	Max. hp 250
RT-630 CRANE-GROVE	Diesel	160	4	672	0.5	1.9	3.5	0.004	0.2	321.4	0.04	0.039	0.16	0.29	0.0003	0.017	24	0.0032	Cranes	Max. hp 175
RT-860B CRANE-GROVE	Diesel	190	4	672	0.5	1.3	4.6	0.005	0.2	448.6	0.04	0.039	0.11	0.39	0.0004	0.014	34	0.0032	Cranes	Max. hp 250
P/33/24 TRENCH COMPACTOR-RAMMEX	Diesel	18	24	4,032	0.4	1.3	2.5	0.004	0.1	317.2	0.03	0.032	0.11	0.21	0.0003	0.010	24	0.0027	Other Construction Equipment	Max. hp 25
P185 WD AIR COMPRESSOR-IR	Diesel	78	16	2,688	1.5	5.3	9.1	0.009	0.8	751.2	0.14	0.13	0.45	0.76	0.00	0.07	57	0.0105	Air Compressors	Max. hp. 50
390 AIR COMPRESSOR-QUINCY	Diesel	37	8	1,344	0.9	2.2	1.9	0.002	0.2	178	0.08	0.073	0.18	0.2	0.0002	0.017	14	0.0060	Air Compressors	Max. hp. 50
1500 AIR COMPRESSOR-IR	Diesel	460	16	2,688	2.9	9.9	32.9	0.036	1.1	3,708	0.26	0.243	0.83	2.8	0.0031	0.092	283	0.0199	Air Compressors	Max. hp. 500
SA250 WELD MACHINE-LINCOLN	Diesel	40	36	6,048	4.2	10.6	9.7	0.012	1.0	934	0.38	0.350	0.89	0.8	0.0010	0.083	71	0.0286	Welders	Max. hp. 50
60KW GENERATOR-IR	Diesel	72	16	2,688	2.1	8.0	13.8	0.015	1.1	1,247	0.19	0.175	0.67	1.2	0.0012	0.092	95	0.0144	Generators	Max. hp. 120
G115KW GENERATOR-IR	Diesel	125	16	2,688	2.1	8.0	13.8	0.015	1.1	1,247	0.19	0.175	0.67	1.2	0.0012	0.092	95	0.0144	Generators	Max. hp. 120
G260KW GENERATOR-IR	Diesel	310	16	3,168	3.4	13.0	44.7	0.053	1.3	5,390	0.30	0.334	1.29	4.4	0.0052	0.131	484	0.0273	Generators	Max. hp. 500
3" PUMP MQ	Gas	4	32	6,336	0.5	1.7	2.6	0.004	0.2	237.6	0.04	0.045	0.16	0.26	0.0004	0.019	21	0.0037	Pumps	Max. hp 15
CD150M 6" PUMP-GODWIN	Diesel	90	32	6,336	4.3	16.3	28.0	0.029	2.3	2,494.4	0.39	0.428	1.61	2.77	0.0029	0.226	224	0.0350	Pumps	Max. hp 120
ASPHALT ZIPPER 480	Diesel	110	6	1,008	0.9	3.1	5.5	0.005	0.5	415.2	0.08	0.078	0.26	0.47	0.0004	0.041	32	0.0064	Pavers	Max. hp 120
8-HC SWEEPER-LAYMOR	Diesel	30	4	672	0.8	2.2	1.9	0.002	0.2	189.3	0.07	0.045	0.125	0.108	0.000	0.011	10	0.0037	Sweepers	Max. hp 50
3-5 TON SMOOTH DRUM ROLLER	Diesel	43	8	1,344	0.7	1.8	1.6	0.002	0.2	155.9	0.09	0.080	0.207	0.182	0.000	0.019	16	0.0065	Rollers	Max. hp 50
CONCRETE-AC.SAW	Diesel	5	16	2,688	0.1	0.4	0.8	0.001	0.0	98.9	0.03	0.027	0.091	0.170	0.000	0.008	20	0.0022	Concrete Saws	Max. hp 25
TOTAL				40	136	302	0.34	16	31217	3.6	3.5	12	27	0.030	1.4	2503	0.28	-	-	

Table 20
Emissions for Non-Road Equipment - Hammer Bore and Auger Bore Crews
Calnev Expansion Project

Hammer Bore Crew

Equipment Type	Fuel Type	Equipment Engine Size (hp)	Total Daily Operation of All Units (hr/day)	Total Hourly usage (hrs)	Daily Emissions (lbs/day)							Total Emissions (tons)							Total Emissions (metric tons)	Emission Factor Reference
					VOC	CO	NO _x	SO ₂	PM	CO ₂	CH ₄	VOC	CO	NO _x	SO ₂	PM	CO ₂	CH ₄		
2 TON FLATBED W/10 TON CRANE	Diesel	350	5	690	0.9	3.1	8.2	0.009	0.31	900.5	0.08	0.06	0.21	0.57	0.0006	0.02	56	0.005	Cranes	Max. hp 500
3 AXL FLATBED W/12+ TON CRANE	Diesel	350	5	690	0.9	3.1	8.2	0.0	0.3	900.5	0.1	0.06	0.21	0.57	0.00	0.02	56	0	Cranes	Max. hp 500
900 AIR COMPRESSOR-IR	Diesel	275	20	2,760	3.6	12.3	41	0.045	1.4	4634.8	0.33	0.25	0.85	2.84	0.0031	0.09	290	0.020	Air Compressors	Max. hp 500
3' PUMP MQ	Gas	4	40	5,520	0.6	2.1	3.3	0.005	0.23	297.0	0.05	0.04	0.14	0.23	0.0003	0.02	19	0.003	Crawler Tractors	Max. hp 500
TOTAL					5.9	21	61	0.068	2.2	6733	0.53	0.41	1.4	4.2	0.0047	0.2	421	0.033	-	-

Auger Bore Crew

Equipment Type	Fuel Type	Equipment Engine Size (hp)	Total Daily Operation of All Units (hr/day)	Total Hourly usage (hrs)	Daily Emissions (lbs/day)							Total Emissions (tons)							Total Emissions (metric tons)	Emission Factor Reference
					VOC	CO	NO _x	SO ₂	PM	CO ₂	CH ₄	VOC	CO	NO _x	SO ₂	PM	CO ₂	CH ₄		
3 AXL FLATBED W/12+ TON CRANE	Diesel	350	5	690	0.9	3.1	8.2	0.0088	0.3	900.5	0.08	0.06	0.21	0.57	0.0006	0.022	56.37	0.0049	Cranes	Max. hp 500
3 AXL LOWBED TRACTOR & TRAILER	Diesel	350	5	690	1.4	5.5	12.8	0.0	0.5	1296.1	0.1	0.10	0.38	0.88	0.00	0.04	81.13	0.01	Crawler Tractors	Max. hp 500
325BL EXCAVATOR-CAT	Diesel	188	8	1,035	1.0	2.8	10.2	0.013	0.3	1190.1	0.09	0.07	0.19	0.71	0.0009	0.024	74.50	0.0058	Excavators	Max. hp 250
R1-630 CRANE-GROVE	Diesel	160	5	690	0.6	2.4	4.4	0.0045	0.3	401.7	0.05	0.04	0.17	0.30	0.00031	0.018	25.15	0.0032	Cranes	Max. hp 175
SA250 WELD MACHINE-LINCOLN	Diesel	40	8	1,035	0.9	2.2	2.0	0.0025	0.2	194.7	0.08	0.06	0.15	0.14	0.0002	0.014	12.19	0.0049	Welders	Max. hp 50
G115KW GENERATOR-IR	Diesel	125	20	2,760	3.1	14.9	28.0	0.0	1.4	2839.6	0.3	0.22	1.03	1.93	0.00	0.10	177.75	0.0178	Generators	Max. hp 175
3' PUMP MQ	Gas	4	20	2,760	0.3	1.0	1.7	0.0023	0.1	148.5	0.03	0.02	0.07	0.11	0.0002	0.008	9.29	0.0016	Pumps	Max. hp 15
AUGER BORE MACHINE	Diesel	106	10	1,380	0.6	4.8	5.6	0.0090	0.4	771.2	0.05	0.04	0.33	0.39	0.0006	0.028	48.28	0.0034	Bore/Drill Machines	Max. hp 120
TOTAL					9	37	73	0.085	3.5	7742	0.79	0.6	2.5	5.0	0.0059	0.24	485	0.05	-	-

Table 21
Emissions for Non-Road Equipment - HDD and Station Work Crews
Calnev Expansion Project

HDD Crew Nos. 1, 2 and 3 (Emissions Listed are for Each Crew)

Equipment Type	Fuel Type	Equipment Engine Size (hp)	Total Daily Operation of All Units (hr/day)	Total Hourly usage (hrs)	Daily Emissions (lbs/day)							Total Emissions (tons)							Total Emissions (metric tons)		Emission Factor Reference	
					VOC	CO	NO _x	SO ₂	PM	CO ₂	CH ₄	VOC	CO	NO _x	SO ₂	PM	CO ₂	CH ₄	Equipment Type	Size		
FORKLIFT, 8000+ LBS	Diesel	110	15	2,520	0.8	3.3	4.9	0.005	0.5	468.4	0.07	0.07	0.28	0.41	0.0005	0.039	36	0.006	Forklifts	Max. hp 120		
330BL EXCAVATOR-CAT	Diesel	204	23	3,105	3.1	8.5	30.7	0.0	1.0	3570.4	0.3	0.21	0.58	2.12	0.00	0.07	223	0	Excavators	Max. hp 250		
580SL BACKHOE-CASE	Diesel	110	23	3,105	1.9	8.1	11.9	0.014	1.1	1163.9	0.17	0.13	0.56	0.82	0.0009	0.074	73	0.011	Tractor/Loader/Backhoe	Max. hp 120		
RT-860B CRANE-GROVE	Diesel	190	15	2,070	1.8	4.9	17.3	0.019	0.6	1682.4	0.16	0.12	0.34	1.19	0.0013	0.044	105	0.010	Cranes	Max. hp 250		
SAM 400 WELDER-LINCOLN	Diesel	57	23	3,105	2.6	6.6	6.0	0.008	0.6	584.1	0.23	0.18	0.46	0.42	0.0005	0.043	37	0.015	Welders	Max. hp 50		
G260KW GENERATOR-IR	Diesel	310	20	2,760	4.2	16.3	55.8	0.066	1.7	6737.1	0.38	0.29	1.12	3.85	0.0046	0.11	422	0.024	Generators	Max. hp 500		
LIGHT TOWERS	Diesel	13	80	11,040	0.9	4.9	5.9	0.013	0.2	808.6	0.08	0.06	0.34	0.41	0.0009	0.016	51	0.005	Other Construction Equip.	Max. hp 15		
750,000 # DRILL RIG (2 3408 E ENG)	Diesel	1150	10	1,380	4.9	16.9	73.9	0.093	1.9	9282.8	0.44	0.34	1.17	5.10	0.0064	0.13	581	0.028	Bore/Drill Rigs	Max. hp 1000		
MUD TANK CLEANING SYST. INCL. PUMPS	Diesel	750	10	1,380	3.8	14.2	49.2	0.1	1.5	5707.0	0.3	0.26	0.98	3.39	0.00	0.10	357	0	Pumps	Max. hp 750		
150,000 # DRILL RIG	Diesel	300	10	1,380	1.4	5.5	14.9	0.031	0.5	3113.1	0.13	0.10	0.38	1.03	0.0021	0.036	195	0.008	Bore/Drill Rigs	Max. hp 500		
MUD TANK CLEANING SYST. INCL. PUMPS	Diesel	460	10	1,380	2.2	8.6	28.9	0.034	0.9	3452.0	0.20	0.16	0.59	2.00	0.0023	0.061	216	0.013	Pumps	Max. hp 500		
80,000 # DRILL RIG	Diesel	200	10	1,380	0.9	3.4	10.1	0.021	0.3	1881.0	0.08	0.06	0.24	0.70	0.0015	0.022	118	0.005	Bore/Drill Rigs	Max. hp 250		
MUD TANK CLEANING SYST. INCL. PUMPS	Diesel	87	10	1,380	1.4	5.1	8.8	0.009	0.7	779.5	0.12	0.09	0.35	0.60	0.0006	0.049	49	0.008	Pumps	Max. hp 120		
TOTAL					30	106	318	0.41	12	39230	2.7	2	7	22	0.028	0.80	2462	0.17	-	-	-	-

Station Work Crew Nos. 1 and 2 (Emissions Listed are for Each Crew)

Equipment Type	Fuel Type	Equipment Engine Size (hp)	Total Daily Operation of All Units (hr/day)	Total Hourly usage (hrs)	Daily Emissions (lbs/day)							Total Emissions (tons)							Total Emissions (metric tons)		Emission Factor Reference	
					VOC	CO	NO _x	SO ₂	PM	CO ₂	CH ₄	VOC	CO	NO _x	SO ₂	PM	CO ₂	CH ₄	Equipment Type	Size		
3 AXL FLATBED W/12+ TON CRANE	Diesel	350	10	720	1.7	6.1	16.5	0.02	0.6	1801.0	0.2	0.06	0.22	0.59	0.00	0.02	58.82	0.0051	Cranes	Max. hp 500		
3 AXL DUMP TRUCK 10 C.Y.	Diesel	350	30	2,160	7.1	21.2	63.7	0.1	2.4	8170.0	0.6	0.26	0.76	2.29	0.00	0.08	266.82	0.02	Off-Highway Trucks	Max. hp 500		
330BL EXCAVATOR-CAT	Diesel	204	15	1,080	2.1	5.6	20.4	0.03	0.7	2380.2	0.2	0.07	0.20	0.74	0.00	0.03	77.74	0.0061	Excavators	Max. hp 250		
430D BACKHOE-CAT	Diesel	102	15	1,080	1.2	5.4	7.9	0.01	0.7	775.9	0.1	0.04	0.19	0.29	0.00	0.03	25.34	0.0037	Tractors/Loaders/Backhoes	Max. hp 120		
914G WHEEL LOADER-CAT	Diesel	90	5	360	0.6	2.1	3.4	0.00	0.3	294.6	0.1	0.02	0.08	0.12	0.00	0.01	9.62	0.0017	Rubber Tire Loaders	Max. hp 120		
RT-518 CRANE-GROVE	Diesel	110	5	360	0.5	1.8	3.1	0.00	0.3	250.7	0.0	0.02	0.07	0.11	0.00	0.01	8.19	0.0015	Cranes	Max. hp 120		
RT-630 CRANE-GROVE	Diesel	160	5	360	0.6	2.4	4.4	0.00	0.3	401.7	0.1	0.02	0.09	0.16	0.00	0.01	13.12	0.0017	Cranes	Max. hp 175		
RT-860B CRANE-GROVE	Diesel	190	5	360	0.6	1.6	5.8	0.01	0.2	560.8	0.1	0.02	0.06	0.21	0.00	0.01	18.31	0.0017	Cranes	Max. hp 250		
P185 WD AIR COMPRESSOR-IR	Diesel	78	30	2,160	2.9	10.0	17.0	0.02	1.6	1408.5	0.3	0.10	0.36	0.61	0.00	0.06	46.00	0.0085	Air Compressors	Max. hp 120		
1500 AIR COMPRESSOR-IR	Diesel	460	10	720	1.8	6.2	20.6	0.02	0.7	2317.4	0.2	0.07	0.22	0.74	0.00	0.02	75.68	0.0053	Air Compressors	Max. hp 500		
SA250 WELD MACHINE-LINCOLN	Diesel	40	75	5,400	8.7	22.1	20.1	0.03	2.1	1946.9	0.8	0.31	0.80	0.72	0.00	0.07	63.58	0.0256	Welders	Max. hp 50		
TOTAL					28	85	183	0.22	9.8	20308	3	1	3	7	0	0	663	0.082	-	-	-	-

Table 22
On-Road Vehicles - Mainline and Street Work Spreads
Calnev Expansion Project

Mainline Spreads Nos. 1 and 2 (Data Listed are for Each Spread)

Vehicle Description	Vehicle Class	Roundtrips per Unit	Travel on Roads per Roundtrip (miles)		Total Working Days per Unit	No. of Units									Total Daily VMT All Units (VMT/day)			Total Overall VMT of All Units (VMT)				
			Unpaved Roads	Paved Roads		Pot-holing	R/W Clearing	Ditching	String Pipe	Pipe Bending	Pipe Welding	Pipe Install	Backfill Pipe	Supervision	TOTAL	Unpaved Roads	Paved Roads	TOTAL	Unpaved Roads	Paved Roads	TOTAL	
3/4 TON PICKUP 2WD-FORD	LDDT12	1	10	60	198	2	4	4	2	2	2	2	2	4	24	240	1,440	1,680	47,520	285,120	332,640	
8 PASSANGER VAN	LDDT12	1	10	60	168		1	2	1	2			2		8	80	480	560	13,440	80,640	94,080	
1 TON FLATBED 2WD-FORD	LDDT12	1	10	60	198	1	1	1	2	1	1		1	2	10	100	600	700	19,800	118,800	138,600	
1 TON FLATBED 2WD-FORD	LDDT12	1	10	60	168							8	4		12	120	720	840	20,160	120,960	141,120	
1 TON MECHANIC 2WD-FORD	LDDT12	1	10	60	198									2	2	20	120	140	3,960	23,760	27,720	
2 TON FLATBED-FORD	HDDV3	1	10	60	198			2	2				2		2	8	80	480	560	15,840	95,040	110,880
2 AXL 26 PASSANGER BUS-INLR.	HDDV3	1	10	60	168							1			1	10	60	70	1,680	10,080	11,760	
2 AXL WATER TRUCK	HDDV6	8	10	60	168		2						2		4	320	1,920	2,240	53,760	322,560	376,320	
3 AXL FUEL TRUCK	HDDV6	1	10	60	168									3	3	30	180	210	5,040	30,240	35,280	
3 AXL SANDBLAST TRUCK	HDDV6	1	10	60	168							4		4	40	240	280	6,720	40,320	47,040		
3 AXL DUMP TRUCK 10 C.Y.	HDDV6	5	10	60	168			4				4		8	400	2,400	2,800	67,200	403,200	470,400		
3 AXL LOWBED TRACTOR & TRAILER	HDDV6	1	10	60	198									2	2	20	120	140	3,960	23,760	27,720	
Worker Buses	HDBT	1	10	60	198									2	20	120	140	3,960	23,760	27,720		
Diesel Vehicle Subtotal															1,480	8,880	10,360	263,040	1,578,240	1,841,280		
			10	60	198									0	0	0	0	0	0	0		
TOTAL															1,480	8,880	10,360	263,040	1,578,240	1,841,280		

Street Work Spreads Nos. 1, 2 and 3 (Data Listed are for Each Spread)

Vehicle Description	Vehicle Class	Roundtrips per Unit	Travel on Roads per Roundtrip (miles)		Total Working Days per Unit	No. of Units										Total Daily VMT All Units (VMT/day)			Total Overall VMT of All Units (VMT)			
			Unpaved Roads	Paved Roads		Pot-holing	Ditching	String Pipe	Pipe Bending	Pipe Welding	Pipe Install	Backfill Pipe	Repave & Clean-Up	Supervision	TOTAL	Unpaved Roads	Paved Roads	TOTAL	Unpaved Roads	Paved Roads	TOTAL	
3/4 TON PICKUP 2WD-FORD	LDDT12	1	1	30	198	1	1	1				1	1	1	2	8	8	240	248	1,584	47,520	49,104
1 TON FLATBED 2WD-FORD	LDDT12	1	1	30	168		1	1		1		1	1	1	6	6	180	186	1,008	30,240	31,248	
1 TON FLATBED 2WD-FORD	LDDT12	1	1	30	168					2	2				4	4	120	124	672	20,160	20,832	
1 TON MECHANIC 2WD-FORD	LDDT12	1	1	30	168									1	1	1	30	31	168	5,040	5,208	
2 TON FLATBED-FORD	HDDV3	1	1	30	168		1		1					1	1	4	4	120	124	672	20,160	20,832
3 AXL FUEL TRUCK	HDDV6	1	1	30	168									1	1	1	30	31	168	5,040	5,208	
3 AXL SANDBLAST TRUCK	HDDV6	1	1	30	168							2			2	2	60	62	336	10,080	10,416	
2 AXL DUMP TRUCK 5 C.Y.	HDDV6	15	1	30	168		1					2	1		4	60	1,800	1,860	10,080	302,400	312,480	
3 AXL DUMP TRUCK 10 C.Y.	HDDV6	15	1	30	168		6								6	90	2,700	2,790	15,120	453,600	468,720	
3 AXL LOWBED TRACTOR & TRAILER	HDDV6	1	1	30	168									1	1	1	30	31	168	5,040	5,208	
3 AXL WATER TRUCK	HDDV6	1	1	30	168							3			3	3	90	93	504	15,120	15,624	
Worker Buses	HDBT	1	1	30	168										1	1	30	31	168	5,040	5,208	
Diesel Vehicle Subtotal															181	5,430	5,611	30,648	919,440	950,088		
			1	30	168										0	0	0	0	0	0		
TOTAL															181	5,430	5,611	30,648	919,440	950,088		

Table 23
On-Road Vehicles - Hammer Bore and Auger Bore Crews
Calnev Expansion Project

Hammer Bore Crew

Vehicle Description	Vehicle Class	Roundtrips per Unit	Travel on Roads per Roundtrip (miles)		Total Working Days per Unit	No. of Units		Total Daily VMT All Units (VMT/day)			Total Overall VMT of All Units (VMT)		
			Unpaved Roads	Paved Roads		Boring	TOTAL	Unpaved Roads	Paved Roads	TOTAL	Unpaved Roads	Paved Roads	TOTAL
3/4 TON PICKUP 2WD-FORD	LDDT12	1	10	60	168	4	4	40	240	280	6,720	40,320	47,040
2 TON FLATBED-FORD	HDDV3	1	10	60	168	2	2	20	120	140	3,360	20,160	23,520
Worker Buses	HDBBT	1	10	60	168		1	10	60	70	1,680	10,080	11,760
TOTAL							70	420	490	11,760	70,560	82,320	

Auger Bore Crew

Vehicle Description	Vehicle Class	Roundtrips per Unit	Travel on Roads per Roundtrip (miles)		Total Working Days per Unit	No. of Units		Total Daily VMT All Units (VMT/day)			Total Overall VMT of All Units (VMT)		
			Unpaved Roads	Paved Roads		Boring	TOTAL	Unpaved Roads	Paved Roads	TOTAL	Unpaved Roads	Paved Roads	TOTAL
3/4 TON PICKUP 2WD-FORD	LDDT12	1	10	60	168	4	4	40	240	280	6,720	40,320	47,040
2 TON FLATBED-FORD	HDDV3	1	10	30	168	1	1	10	30	40	1,680	5,040	6,720
Worker Buses	HDBBT	1	10	60	168		1	10	60	70	1,680	10,080	11,760
TOTAL							60	330	390	10,080	55,440	65,520	

Table 24
On-Road Vehicles - HDD and Station Crews
Calnev Expansion Project

HDD Crew Nos. 1, 2, and 3 (Data Listed are for Each Crew)

Vehicle Description	Vehicle Class	Roundtrips per Unit	Travel on Roads per Roundtrip (miles)		Total Working Days per Unit	No. of Units			Total Daily VMT All Units (VMT/day)			Total Overall VMT of All Units (VMT)		
			Unpaved Roads	Paved Roads		Drilling	Pipe Pull	TOTAL	Unpaved Roads	Paved Roads	TOTAL	Unpaved Roads	Paved Roads	TOTAL
3/4 TON PICKUP 2WD-FORD	LDDT12	1	10	60	138	2	2	6	60	360	420	8,280	49,680	57,960
8 PASSANGER VAN	LDDT12	1	10	60	138		1	3	30	180	210	4,140	24,840	28,980
1 TON FLATBED 2WD-FORD	LDDT12	1	10	60	138	1	1	6	60	360	420	8,280	49,680	57,960
2 AXL WATER TRUCK	HDDV6	5	10	60	138	1		3	150	900	1,050	20,700	124,200	144,900
VACUUM TRUCK	HDDV6	1	10	60	138	1	3	6	60	360	420	8,280	49,680	57,960
VACUUM TRAILER	HDDV6	1	10	60	138	1		3	30	180	210	4,140	24,840	28,980
Worker Buses	HDBBT	1	10	60	138			1	10	60	70	1,380	8,280	9,660
TOTAL								400	2,400	2,800	55,200	331,200	386,400	

Station Crew Nos. 1 and 2 (Data Listed are for Each Crew)

Vehicle Description	Vehicle Class	Roundtrips per Unit	Travel on Roads per Roundtrip (miles)		Total Working Days per Unit	No. of Units					Total Daily VMT All Units (VMT/day)			Total Overall VMT of All Units (VMT)			
			Unpaved Roads	Paved Roads		Excavation Work	& Fabrication	Installation	Backfilling & Cleanup	Supervision	TOTAL	Unpaved Roads	Paved Roads	TOTAL	Unpaved Roads	Paved Roads	TOTAL
3/4 TON PICKUP 2WD-FORD	LDDT12	1	5	60	92	1	1	1	1	2	6	30	360	390	2,760	33,120	35,880
1 TON FLATBED 2WD-FORD	LDDT12	1	1	30	72		6				6	6	180	186	432	12,960	13,392
1 TON FLATBED 2WD-FORD	LDDT12	1	1	30	72			4			4	4	120	124	288	8,640	8,928
CONCRETE TRUCK	HDDV6	1	1	30	72			2			2	2	60	62	144	4,320	4,464
FUEL TRUCK	HDDV6	1	1	30	72	1	1	1	1		4	4	120	124	288	8,640	8,928
Worker Buses	HDBBT	1	1	60	72						1	1	60	61	72	4,320	4,392
TOTAL											47	900	947	3,984	72,000	75,984	

Table 25
On-Road Vehicle Exhaust Emission Factors
Calnev Expansion Project

Vehicle Type	Emission Factor ^a (pounds/VMT)							
	VOC	CO	NOx	SOx	PM10	PM2.5	CO2	CH4
Diesel Delivery Trucks	0.002419	0.01693	0.01893	0.0000273	0.0007010	0.0005968	2.752	0.0001166

Notes:

a. Emission factors from SCAQMD file "onroadEF07_26.xls". Year: 2011.

Table 26
Emissions for On-Road Vehicles
Calnev Expansion Project

Spread / Crew	Fuel Type	Total Daily VMT (VMT/day)	Total Overall VMT (VMT)	Daily Emissions (lbs/day)								Total Emissions (tons)						Total Emissions (metric tons)	
				VOC	CO	NO _x	SO ₂	PM10	PM2.5	CO ₂	CH ₄	VOC	CO	NO _x	SO ₂	PM10	PM2.5	CO ₂	CH ₄
Mainline Spreads	Diesel Delivery Truck	10,360	1,841,280	25	175	196	0.28	7.3	6.2	28,509	1.2	2.2	15.6	17.4	0.025	0.65	0.55	2,298	0.10
	Subtotal	-	-	25	175	196	0.28	7.3	6.2	28,509	1.2	2.2	15.6	17.4	0.025	0.65	0.55	2,298	0.10
Street Work Spreads	Diesel Delivery Truck	5,611	950,088	14	95	106	0.15	3.9	3.3	15,440	0.65	1.1	8.0	9.0	0.013	0.33	0.28	1,186	0.050
	Subtotal	-	-	14	95	106	0.15	3.9	3.3	15,440	0.65	1.1	8.0	9.0	0.013	0.33	0.28	1,186	0.050
Hammer Bore Crew	Diesel Delivery Truck	490	82,320	1.2	8.3	9.3	0.013	0.34	0.29	1,348	0.057	0.1	0.70	0.78	0.0011	0.03	0.025	103	0.0044
	Subtotal	-	-	1.2	8.3	9.3	0.013	0.34	0.29	1,348	0.057	0.1	0.70	0.78	0.0011	0.03	0.025	103	0.0044
Auger Bore Crew	Diesel Delivery Truck	390	65,520	0.9	6.6	7.4	0.011	0.27	0.23	1,073	0.045	0.1	0.55	0.62	0.0009	0.02	0.020	82	0.0035
	Subtotal	-	-	0.9	6.6	7.4	0.011	0.27	0.23	1,073	0.045	0.1	0.55	0.62	0.0009	0.02	0.020	82	0.0035
HDD Crews	Diesel Delivery Truck	2,800	386,400	6.8	47	53	0.076	2.0	1.7	7,705	0.33	0.5	3.3	3.7	0.0053	0.14	0.12	482	0.020
	Subtotal	-	-	6.8	47	53	0.076	2.0	1.7	7,705	0.33	0.5	3.3	3.7	0.0053	0.14	0.12	482	0.020
Station Crews	Diesel Delivery Truck	947	75,984	2.3	16	18	0.026	0.66	0.57	2,606	0.11	0.092	0.64	0.72	0.0010	0.03	0.023	95	0.0040
	Subtotal	-	-	2.3	16	18	0.026	0.66	0.57	2,606	0.11	0.1	0.64	0.72	0.0010	0.03	0.023	95	0.0040

Table 27
Fugitive Dust Emissions - Construction Sites
Calnev Expansion Project

Construction Activity	Disturbance (acres)	Duration of Activity (months)	Emission Factor ^a (ton/acre/month)		Daily Emissions (lbs/day)		Emissions (tons)	
			PM ₁₀	PM _{2.5}	PM ₁₀	PM _{2.5}	PM ₁₀	PM _{2.5}
Mainline Spreads ^b	6	5.6	0.11	0.023	60	13	3.7	0.78
Street Work Spreads ^c	1.5	5.6	0.11	0.023	15	3.2	0.9	0.19
Hammer Bore Crew	1	4.5	0.11	0.023	10	2.1	0.5	0.10
Auger Bore Crew	1	4.5	0.11	0.023	10	2.1	0.5	0.10
HDD Crew	1	4.5	0.11	0.023	10	2.1	0.5	0.10
Station Work	1	2.5	0.11	0.023	10	2.1	0.28	0.058

Notes:

a. See emission factor derivation table below.

b. Pipeline construction area based on all concurrent work on a total surface area of a 100-ft wide corridor with a length of one half mile.

c. Pipeline construction area based on all concurrent work on a total surface area of a 50-ft wide corridor with a length of one quarter mile.

Emission Factor Derivation Table

Parameter	Units ¹	PM ₁₀ ⁽²⁾	PM _{2.5} ⁽³⁾
Uncontrolled Emission Factor	ton/acre/month	0.22	0.046
Controlled Emission Factor ⁴	ton/acre/month	0.11	0.023

Notes:

1. Based on 22 days/month.

2. from UREMIS2007 User's Guide

3. assumes PM2.5 fraction is 21% of PM10 fraction.

4. Assume 50% dust control based on watering.

Table 28
Fugitive Dust Emission Factors - Roads
Calnev Expansion Project

Unpaved Roads - Emission Factor Derivation

$E = k(s/12)^3(W/3)^b$	AP-42 Section 13.2.2			
where:				
E = particulate emission factor (lb/VMT) k, a, b = empirical constants for industrial roads s = surface material silt content (%) W = average vehicle weight (tons)				
Parameter	Units	PM ₁₀	PM _{2.5}	Reference
Mean Vehicle Weight	tons	8	8	Assumption
Constant, k	lb/VMT	1.5	0.15	Table 13.2.2-2 (worst case)
Constant, a		0.9	0.9	Table 13.2.2-2 (worst case)
Constant, b		0.45	0.45	Table 13.2.2-2 (worst case)
Silt content, s	%	8.5	8.5	Table 13.2.2-1 (construction sites)
Uncontrolled Emission factor, E	lb/VMT	1.71	0.171	Calculation
Controlled Emission factor	lb/VMT	0.43	0.043	Calculation

Paved Roads - Emission Factor Derivation Table

$E = (k(sL/2)^{0.65}(W/3)^{1.5}-C)$	AP-42 Section 13.2.1 (11/06 version)			
where:				
E = particulate emission factor (lb/VMT) k = particle size multiplier sL = road surface silt loading (g/m ²) W = average vehicle weight (tons) C = emission factor for 1980's vehicle fleet exhaust, break wear and tire wear				
Parameter	Units	PM ₁₀	PM _{2.5}	Reference
Mean Vehicle Weight	tons	3	3	Assumption
k factor	lb/VMT	0.016	0.0024	Table 13.2-1.1
Silt Loading, sL	g/m ²	0.6	0.6	Table 13.2.1-3
Emission factor, C	lb/VMT	0.00047	0.00036	Table 13.2.1-2
Emission factor, E	lb/VMT	0.00685	0.000737	Calculation

Table 29
Fugitive Dust Emissions for Roads
Calnev Expansion Project

Spread / Crew	Total Daily VMT (VMT/day)		Total Overall VMT (VMT)		Unpaved Roads				Paved Roads				Total			
					Daily Emissions (lbs/day)		Total Emissions (tons)		Daily Emissions (lbs/day)		Total Emissions (tons)		Daily Emissions (lbs/day)		Total Emissions (tons)	
	Unpaved Roads	Paved Roads	Unpaved Roads	Paved Roads	PM10	PM2.5	PM10	PM2.5	PM10	PM2.5	PM10	PM2.5	PM10	PM2.5	PM10	PM2.5
Mainline Spread	1,480	8,880	263,040	1,578,240	633	63	56	6	61	6.5	5.4	0.58	693	70	62	6
Street Work Spread	181	5,430	30,648	919,440	77	7.7	6.6	0.66	37	4.00	3.15	0.339	115	11.7	9.7	1.0
Hammer Bore Crew	70	420	11,760	70,560	30	3	3	0.3	2.9	0.31	0.24	0.026	33	3.3	2.8	0.28
Auger Bore Crew	60	330	10,080	55,440	26	3	2	0.2	2.3	0.24	0.19	0.020	28	2.8	2.3	0.2
HDD Crews	400	2,400	55,200	331,200	171	17	12	1.2	16	1.77	1.1	0.12	187	19	13	1.3
Station Crews	47	900	3,984	72,000	20	2.0	0.9	0.09	6.2	0.66	0.25	0.027	26	2.7	1.1	0.11

Part II
Emission Calculations for Street Work Spread - Pipe Installation
Calnev Expansion Project

Table No.	Title
Table 1	Summary of Daily Construction Emissions - Pipe Installation During Street Work Spread
Table 2	Non-Road Equipment - Street Work Spread
Table 3	Non-Road Equipment Exhaust Emission Factors
Table 4	Emissions for Non-Road Equipment - Pipe Installation During Street Work Spread
Table 5	Fugitive Dust Emissions - Pipe Installation During Street Work Spread

Table 1
Summary of Daily Construction Emissions - Pipe Installation During Street Work Spread
Calnev Expansion Project

Spread / Crew	Activity	Emission Type	Emissions (lbs/day)					
			VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}
Street Work Spread	Pipe Installation	Exhaust Emissions	16	52	132	0.15	6.0	6.0
		Fugitive Dust Emissions	-	-	-	-	7.0	1.5
		Subtotal	16	52	132	0.15	13	7.5

Table 2
Non-Road Equipment - Street Work Spread
Calnev Expansion Project

Table 3
Non-Road Equipment Exhaust Emission Factors
Calnev Expansion Project

Equipment	Maximum Operating Range (hp)	Emission Factor (lb/hr)						
		VOC	CO	NOX	SO2	PM	CO2	CH4
Aerial Lifts	15	0.0103	0.0528	0.0650	0.0001	0.0033	8.7	0.0009
	25	0.0192	0.0546	0.0984	0.0001	0.0060	11.0	0.0017
	50	0.0706	0.1884	0.1952	0.0003	0.0179	19.6	0.0064
	120	0.0657	0.2477	0.4270	0.0004	0.0346	38.1	0.0059
	500	0.1378	0.5300	1.7852	0.0021	0.0540	213	0.0124
	750	0.2567	0.9581	3.3162	0.0039	0.091	385	0.0232
		0.0624	0.2033	0.3429	0.0004	0.0235	34.7	0.0056
Aerial Lifts Composite								
Air Compressors	15	0.0137	0.0504	0.0805	0.0001	0.0057	7.2	0.0012
	25	0.0306	0.0814	0.1368	0.0002	0.0093	14.4	0.0028
	50	0.1093	0.2740	0.2350	0.0003	0.0253	22.3	0.0099
	120	0.0956	0.3321	0.5677	0.0006	0.0524	47.0	0.0086
	175	0.1209	0.5096	0.9549	0.0010	0.0548	88.5	0.0109
	250	0.1136	0.3192	1.3087	0.0015	0.0416	131	0.0103
	500	0.1811	0.6166	2.0558	0.0023	0.0682	232	0.0163
Air Compressors Composite								
Bore/Drill Rigs	100	0.4881	1.7108	5.7297	0.0049	0.1705	486	0.0440
	15	0.1054	0.3524	0.6923	0.0007	0.0501	63.6	0.0095
	25	0.0120	0.0632	0.0754	0.0002	0.0029	10.3	0.0011
	50	0.0195	0.0658	0.1242	0.0002	0.0059	16.0	0.0018
	120	0.0436	0.2409	0.2790	0.0004	0.0169	31.0	0.0039
	175	0.0829	0.7539	0.8250	0.0016	0.0446	141	0.0075
	250	0.0892	0.3445	1.0129	0.0021	0.0323	188	0.0081
Bore/Drill Rigs Composite								
Cement and Mortar Mixers	500	0.1418	0.5542	1.4912	0.0031	0.0521	311	0.0128
	750	0.2844	0.9529	3.2673	0.0036	0.1071	358	0.0257
	1000	0.4882	1.7108	5.7297	0.0049	0.1705	486	0.0440
	15	0.0076	0.0387	0.0484	0.0001	0.0026	6.3	0.0007
	25	0.0319	0.0895	0.1589	0.0002	0.0099	17.6	0.0029
		0.0943	0.5102	1.0083	0.0017	0.0436	165	0.0085
	Cement and Mortar Mixers Composite							
Concrete/Industrial Saws	25	0.0200	0.0678	0.1268	0.0002	0.0056	16.5	0.0018
	50	0.1139	0.3112	0.3019	0.0004	0.0284	30.2	0.0103
	120	0.1247	0.4926	0.8118	0.0009	0.0684	74.1	0.0113
	175	0.1805	0.8751	1.5479	0.0018	0.0826	160	0.0163
	Concrete/Industrial Saws Composite							
Cranes	100	0.1179	0.4209	0.6240	0.0007	0.0525	58.5	0.0106
	50	0.1192	0.3071	0.2511	0.0003	0.0273	23.2	0.0108
	120	0.1048	0.3686	0.6196	0.0006	0.0571	50.1	0.0095
	175	0.1149	0.4857	0.8777	0.0009	0.0514	80.3	0.0104
	250	0.1171	0.3276	1.1522	0.0013	0.0428	112	0.0106
	500	0.1726	0.6137	1.6493	0.0018	0.0627	180	0.0156
	750	0.2920	1.0299	2.8472	0.0030	0.1068	303	0.0263
Cranes Composite								
Crawler Tractors	9999	1.0371	3.8402	11.5554	0.0098	0.3585	971	0.0936
	50	0.1507	0.5179	1.3617	0.0014	0.0599	129	0.0136
	120	0.1352	0.3424	0.2745	0.0003	0.0305	24.9	0.0122
	175	0.1461	0.4959	0.8580	0.0008	0.0778	65.8	0.0132
	250	0.1848	0.7540	1.4007	0.0014	0.0818	121	0.0167
	500	0.1950	0.5472	1.8209	0.0019	0.0725	166	0.0176
	750	0.2783	1.1025	2.5536	0.0025	0.1020	259	0.0251
Crawler Tractors Composite	1000	0.5006	1.9682	4.6762	0.0047	0.1844	465	0.0452
	175	0.7588	3.1215	8.1716	0.0066	0.2653	658	0.0685
	250	0.1764	0.6220	1.3069	0.0013	0.0806	114	0.0159
	500	0.2109	0.5418	0.4626	0.0006	0.0493	44.0	0.0190
	750	0.1647	0.5896	0.9809	0.0010	0.0915	83.1	0.0149
	9999	1.2993	4.4184	15.2096	0.0131	0.4525	1,308	0.1172
	Crushing/Proc. Equipment Composite							
Crushing/Proc. Equipment	120	0.2234	0.9697	1.7520	0.0019	0.1023	167	0.0202
	250	0.2081	0.5837	2.3660	0.0028	0.0754	245	0.0188
	500	0.2887	0.9617	3.1941	0.0037	0.1071	374	0.0261
	750	0.4624	1.4856	5.2437	0.0059	0.1718	589	0.0417
	9999	1.2993	4.4184	15.2096	0.0131	0.4525	1,308	0.1172
	Crushing/Proc. Equipment Composite							

Table 3
Non-Road Equipment Exhaust Emission Factors
Calnev Expansion Project

Equipment	Maximum Operating Range (hp)	Emission Factor (lb/hr)						
		VOC	CO	NOX	SO2	PM	CO2	CH4
Dumpers/Tenders	25	0.0103	0.0330	0.0629	0.0001	0.0034	7.6	0.0009
Dumpers/Tenders Composite		0.0103	0.0330	0.0629	0.0001	0.0034	7.6	0.0009
Excavators	25	0.0198	0.0677	0.1255	0.0002	0.0050	16.4	0.0018
	50	0.1018	0.3035	0.2601	0.0003	0.0256	25.0	0.0092
	120	0.1287	0.5267	0.7851	0.0009	0.0725	73.6	0.0116
	175	0.1375	0.6689	1.0363	0.0013	0.0627	112	0.0124
	250	0.1371	0.3762	1.3632	0.0018	0.0465	159	0.0124
	500	0.1889	0.5792	1.7621	0.0023	0.0639	234	0.0170
	750	0.3154	0.9588	3.0187	0.0039	0.1078	387	0.0285
Excavators Composite		0.1388	0.5482	1.0634	0.0013	0.0592	120	0.0125
Forklifts	50	0.0588	0.1749	0.1507	0.0002	0.0149	14.7	0.0053
	120	0.0545	0.2218	0.3262	0.0004	0.0312	31.2	0.0049
	175	0.0681	0.3304	0.5104	0.0006	0.0313	56.1	0.0061
	250	0.0622	0.1667	0.6508	0.0009	0.0207	77.1	0.0056
	500	0.0836	0.2280	0.8064	0.0011	0.0279	111	0.0075
Forklifts Composite		0.0635	0.2284	0.4742	0.0006	0.0257	54.4	0.0057
Generator Sets	15	0.0165	0.0712	0.1110	0.0002	0.0065	10.2	0.0015
	25	0.0287	0.0994	0.1670	0.0002	0.0102	17.6	0.0026
	50	0.1043	0.2826	0.3020	0.0004	0.0270	30.6	0.0094
	120	0.1305	0.5007	0.8616	0.0009	0.0684	77.9	0.0118
	175	0.1572	0.7442	1.3995	0.0016	0.0694	142	0.0142
	250	0.1483	0.4702	1.9373	0.0024	0.0558	213	0.0134
	500	0.2109	0.8134	2.7911	0.0033	0.0830	337	0.0190
	750	0.3517	1.3131	4.6299	0.0055	0.1360	544	0.0317
	9999	0.9398	3.3349	11.5379	0.0105	0.3364	1,049	0.0848
Generator Sets Composite		0.0898	0.3204	0.6121	0.0007	0.0376	61.0	0.0081
Graders	50	0.1290	0.3473	0.2920	0.0004	0.0304	27.5	0.0116
	120	0.1449	0.5405	0.8750	0.0009	0.0801	75.0	0.0131
	175	0.1647	0.7384	1.2722	0.0014	0.0745	124	0.0149
	250	0.1664	0.4709	1.6586	0.0019	0.0603	172	0.0150
	500	0.2045	0.7048	1.9645	0.0023	0.0737	229	0.0185
	750	0.4357	1.4881	4.2746	0.0049	0.1581	486	0.0393
Graders Composite		0.1626	0.6216	1.3404	0.0015	0.0707	133	0.0147
Off-Highway Tractors	120	0.2339	0.7351	1.3587	0.0011	0.1204	93.7	0.0211
	175	0.2229	0.8479	1.6869	0.0015	0.0975	130	0.0201
	250	0.1797	0.5115	1.6148	0.0015	0.0689	130	0.0162
	750	0.7101	3.3111	6.4854	0.0057	0.2682	568	0.0641
	1000	1.0705	5.1530	10.9774	0.0082	0.3811	814	0.0966
Off-Highway Tractors Composite		0.2267	0.8123	1.8919	0.0017	0.0926	151	0.0205
Off-Highway Trucks	175	0.1630	0.7608	1.1915	0.0014	0.0730	125	0.0147
	250	0.1550	0.4101	1.4773	0.0019	0.0515	167	0.0140
	500	0.2372	0.7058	2.1240	0.0027	0.0785	272	0.0214
	750	0.3873	1.1432	3.5575	0.0044	0.1295	442	0.0349
	1000	0.6108	1.9159	6.8506	0.0063	0.2074	625	0.0551
Off-Highway Trucks Composite		0.2355	0.6994	2.1941	0.0027	0.0792	260	0.0212
Other Construction Equipment	15	0.0118	0.0617	0.0737	0.0002	0.0029	10.1	0.0011
	25	0.0161	0.0544	0.1027	0.0002	0.0049	13.2	0.0015
	50	0.0935	0.2833	0.2745	0.0004	0.0245	28.0	0.0084
	120	0.1209	0.5367	0.8097	0.0009	0.0694	80.9	0.0109
	175	0.1086	0.5889	0.9253	0.0012	0.0515	107	0.0098
	500	0.1596	0.5683	1.8098	0.0025	0.0605	254	0.0144
Other Construction Equipment Composite		0.0984	0.3954	0.9321	0.0013	0.0404	123	0.0089
Other General Industrial Equipment	15	0.0066	0.0391	0.0466	0.0001	0.0018	6.4	0.0006
	25	0.0185	0.0632	0.1172	0.0002	0.0047	15.3	0.0017
	50	0.1188	0.2972	0.2375	0.0003	0.0270	21.7	0.0107
	120	0.1371	0.4597	0.7774	0.0007	0.0755	62.0	0.0124
	175	0.1437	0.5788	1.0710	0.0011	0.0646	95.9	0.0130
	250	0.1307	0.3434	1.3989	0.0015	0.0458	136	0.0118
	500	0.2349	0.7297	2.4165	0.0026	0.0832	265	0.0212
	750	0.3901	1.2027	4.1009	0.0044	0.1394	437	0.0352
	1000	0.6008	2.0244	6.7928	0.0056	0.2087	560	0.0542
Other General Industrial Equipment Composite		0.1737	0.5618	1.5591	0.0016	0.0686	152	0.0157
Other Material Handling Equipment	50	0.1648	0.4110	0.3302	0.0004	0.0375	30.3	0.0149
	120	0.1332	0.4476	0.7585	0.0007	0.0735	60.7	0.0120
	175	0.1814	0.7331	1.3603	0.0014	0.0818	122	0.0164
	250	0.1382	0.3659	1.4933	0.0016	0.0488	145	0.0125
	500	0.1674	0.5255	1.7416	0.0019	0.0597	192	0.0151

Table 3
Non-Road Equipment Exhaust Emission Factors
Calnev Expansion Project

Equipment	Maximum Operating Range (hp)	Emission Factor (lb/hr)						
		VOC	CO	NOX	SO2	PM	CO2	CH4
	9999	0.7937	2.6766	8.9765	0.0073	0.2749	741	0.0716
Other Material Handling Equipment Composite		0.1666	0.5304	1.5148	0.0015	0.0665	141	0.0150
Pavers	25	0.0265	0.0827	0.1565	0.0002	0.0086	18.7	0.0024
	50	0.1538	0.3769	0.3073	0.0004	0.0342	28.0	0.0139
	120	0.1551	0.5163	0.9242	0.0008	0.0819	69.2	0.0140
	175	0.1955	0.7892	1.5256	0.0014	0.0869	128	0.0176
	250	0.2300	0.6675	2.1988	0.0022	0.0884	194	0.0208
	500	0.2498	1.0760	2.3832	0.0023	0.0952	233	0.0225
Pavers Composite		0.1684	0.5541	0.9421	0.0009	0.0679	77.9	0.0152
Paving Equipment	25	0.0154	0.0520	0.0981	0.0002	0.0046	12.6	0.0014
	50	0.1311	0.3200	0.2622	0.0003	0.0291	23.9	0.0118
	120	0.1215	0.4038	0.7249	0.0006	0.0642	54.5	0.0110
	175	0.1526	0.6157	1.1976	0.0011	0.0678	101	0.0138
	250	0.1425	0.4146	1.3779	0.0014	0.0548	122	0.0129
Paving Equipment Composite		0.1269	0.4418	0.8536	0.0008	0.0603	68.9	0.0114
Plate Compactors	15	0.0050	0.0263	0.0315	0.0001	0.0013	4.3	0.0005
Plate Compactors Composite		0.0050	0.0263	0.0315	0.0001	0.0013	4.3	0.0005
Pressure Washers	15	0.0079	0.0341	0.0532	0.0001	0.0031	4.9	0.0007
	25	0.0116	0.0403	0.0677	0.0001	0.0041	7.1	0.0011
	50	0.0383	0.1110	0.1364	0.0002	0.0109	14.3	0.0035
	120	0.0361	0.1472	0.2538	0.0003	0.0184	24.1	0.0033
		0.0186	0.0652	0.0956	0.0001	0.0067	9.4	0.0017
Pressure Washers Composite		0.0141	0.0518	0.0827	0.0001	0.0058	7.4	0.0013
Pumps	15	0.0413	0.1098	0.1845	0.0002	0.0125	19.5	0.0037
	50	0.1253	0.3338	0.3424	0.0004	0.0317	34.3	0.0113
	120	0.1350	0.5088	0.8751	0.0009	0.0714	77.9	0.0122
	175	0.1609	0.7461	1.4030	0.0016	0.0714	140	0.0145
	250	0.1463	0.4539	1.8649	0.0023	0.0550	201	0.0132
	500	0.2249	0.8612	2.8947	0.0034	0.0881	345	0.0203
	750	0.3829	1.4237	4.9177	0.0057	0.1479	571	0.0346
	9999	1.2391	4.4349	15.0785	0.0136	0.4418	1,355	0.1118
Pumps Composite		0.0877	0.3040	0.5285	0.0006	0.0375	49.6	0.0079
Rollers	15	0.0074	0.0386	0.0461	0.0001	0.0018	6.3	0.0007
	25	0.0162	0.0549	0.1037	0.0002	0.0049	13.3	0.0015
	50	0.1186	0.3080	0.2714	0.0003	0.0278	26.0	0.0107
	120	0.1126	0.4136	0.7005	0.0007	0.0612	59.0	0.0102
	175	0.1398	0.6243	1.1369	0.0012	0.0633	108	0.0126
	250	0.1441	0.4301	1.5140	0.0017	0.0549	153	0.0130
	500	0.1866	0.7240	1.9447	0.0022	0.0716	219	0.0168
Rollers Composite		0.1106	0.4157	0.7342	0.0008	0.0521	67.1	0.0100
Rough Terrain Forklifts	50	0.1452	0.4046	0.3504	0.0004	0.0354	33.9	0.0131
	120	0.1124	0.4404	0.6880	0.0007	0.0636	62.4	0.0101
	175	0.1541	0.7283	1.2033	0.0014	0.0711	125	0.0139
	250	0.1425	0.4036	1.5294	0.0019	0.0506	171	0.0129
	500	0.1978	0.6345	2.0183	0.0025	0.0708	257	0.0178
Rough Terrain Forklifts Composite		0.1181	0.4721	0.7494	0.0008	0.0638	70.3	0.0107
Rubber Tired Dozers	175	0.2302	0.8604	1.7086	0.0015	0.0998	129	0.0208
	250	0.2659	0.7432	2.3209	0.0021	0.1006	183	0.0240
	500	0.3481	1.6282	3.0411	0.0026	0.1289	265	0.0314
	750	0.5247	2.4391	4.6508	0.0040	0.1951	399	0.0473
	1000	0.8129	3.9143	8.1253	0.0060	0.2871	592	0.0733
Rubber Tired Dozers Composite		0.3244	1.3284	2.8346	0.0025	0.1212	239	0.0293
Rubber Tired Loaders	25	0.0205	0.0697	0.1302	0.0002	0.0058	16.9	0.0019
	50	0.1436	0.3878	0.3286	0.0004	0.0340	31.1	0.0130
	120	0.1124	0.4226	0.6818	0.0007	0.0623	58.9	0.0101
	175	0.1392	0.6305	1.0816	0.0012	0.0633	106	0.0126
	250	0.1408	0.4012	1.4208	0.0017	0.0511	149	0.0127
	500	0.2063	0.7168	2.0063	0.0023	0.0746	237	0.0186
	750	0.4255	1.4649	4.2274	0.0049	0.1550	486	0.0384
	1000	0.5801	2.0836	6.7240	0.0060	0.2029	594	0.0523
Rubber Tired Loaders Composite		0.1354	0.4959	1.0771	0.0012	0.0608	109	0.0122
Scrapers	120	0.2111	0.7087	1.2393	0.0011	0.1122	93.9	0.0190
	175	0.2280	0.9219	1.7346	0.0017	0.1009	148	0.0206
	250	0.2489	0.7019	2.3295	0.0024	0.0931	209	0.0225
	500	0.3488	1.4023	3.2148	0.0032	0.1286	321	0.0315
	750	0.6046	2.4131	5.6704	0.0056	0.2240	555	0.0546
Scrapers Composite		0.3055	1.1660	2.7336	0.0027	0.1172	262	0.0276

Table 3
Non-Road Equipment Exhaust Emission Factors
Calnev Expansion Project

Equipment	Maximum Operating Range (hp)	Emission Factor (lb/hr)						
		VOC	CO	NOX	SO2	PM	CO2	CH4
Signal Boards	15	0.0072	0.0377	0.0450	0.0001	0.0017	6.2	0.0006
	50	0.1387	0.3716	0.3629	0.0005	0.0345	36.2	0.0125
	120	0.1393	0.5327	0.8930	0.0009	0.0755	80.2	0.0126
	175	0.1789	0.8404	1.5271	0.0017	0.0811	155	0.0161
	250	0.1881	0.5757	2.3319	0.0029	0.0707	255	0.0170
Signal Boards Composite		0.0214	0.0946	0.1545	0.0002	0.0087	16.7	0.0019
Skid Steer Loaders	25	0.0229	0.0666	0.1219	0.0002	0.0073	13.8	0.0021
	50	0.0684	0.2411	0.2428	0.0003	0.0198	25.5	0.0062
	120	0.0542	0.2794	0.3835	0.0005	0.0325	42.8	0.0049
Skid Steer Loaders Composite		0.0609	0.2418	0.2800	0.0004	0.0230	30.3	0.0055
Surfacing Equipment	50	0.0551	0.1480	0.1430	0.0002	0.0135	14.1	0.0050
	120	0.1114	0.4291	0.7292	0.0007	0.0595	63.8	0.0101
	175	0.1009	0.4764	0.8677	0.0010	0.0453	85.8	0.0091
	250	0.1172	0.3696	1.2861	0.0015	0.0453	135	0.0106
	500	0.1738	0.7265	1.9125	0.0022	0.0680	221	0.0157
Surfacing Equipment Composite		0.2774	1.1362	3.0719	0.0035	0.1077	347	0.0250
Sweepers/Scrubbers		0.1453	0.5792	1.4651	0.0017	0.0558	166	0.0131
Sweepers/Scrubbers	15	0.0124	0.0729	0.0870	0.0002	0.0033	11.9	0.0011
	25	0.0238	0.0808	0.1510	0.0002	0.0067	19.6	0.0021
	50	0.1345	0.3714	0.3228	0.0004	0.0328	31.6	0.0121
	120	0.1362	0.5266	0.8095	0.0009	0.0782	75.0	0.0123
	175	0.1715	0.8026	1.3252	0.0016	0.0798	139	0.0155
Sweepers/Scrubbers Composite		0.1271	0.3535	1.4297	0.0018	0.0445	162	0.0115
Tractors/Loaders/Backhoes	25	0.0205	0.0670	0.1281	0.0002	0.0066	15.9	0.0019
	50	0.1127	0.3422	0.3070	0.0004	0.0289	30.3	0.0102
	120	0.0833	0.3589	0.5288	0.0006	0.0478	51.7	0.0075
	175	0.1135	0.5873	0.8955	0.0011	0.0530	101	0.0102
	250	0.1336	0.3879	1.4091	0.0019	0.0467	172	0.0121
	500	0.2500	0.8065	2.4813	0.0039	0.0877	345	0.0226
Tractors/Loaders/Backhoes Composite		0.3785	1.2085	3.8514	0.0058	0.1341	517	0.0342
Trenchers		0.0938	0.3874	0.6276	0.0008	0.0482	66.8	0.0085
Trenchers	15	0.0099	0.0517	0.0617	0.0001	0.0023	8.5	0.0009
	25	0.0399	0.1355	0.2532	0.0004	0.0112	32.9	0.0036
	50	0.1746	0.4270	0.3577	0.0004	0.0389	32.9	0.0158
	120	0.1430	0.4784	0.8672	0.0006	0.0746	64.9	0.0129
	175	0.2150	0.8764	1.7133	0.0016	0.0954	144	0.0194
	250	0.2622	0.7775	2.5293	0.0025	0.1025	223	0.0237
	500	0.3295	1.5125	3.2067	0.0031	0.1280	311	0.0297
Trenchers Composite		0.6256	2.8386	6.1534	0.0059	0.2427	587	0.0565
Welders		0.1590	0.4826	0.7297	0.0007	0.0612	58.7	0.0143
Welders	15	0.0118	0.0433	0.0692	0.0001	0.0049	6.2	0.0011
	25	0.0239	0.0636	0.1069	0.0001	0.0073	11.3	0.0022
	50	0.1157	0.2949	0.2683	0.0003	0.0275	26.0	0.0104
	120	0.0760	0.2714	0.4654	0.0005	0.0412	39.5	0.0069
	175	0.1263	0.5496	1.0324	0.0011	0.0569	98.2	0.0114
	250	0.0973	0.2828	1.1575	0.0013	0.0361	119	0.0088
Welders Composite		0.0758	0.2203	0.2818	0.0003	0.0258	25.6	0.0068

Source: SCAQMD emission factors file name "offroadEF_0725.xls" Year: 2011

Table 4
Emissions for Non-Road Equipment - Pipe Installation During Street Work Spread
Calnev Expansion Project

Equipment Type	Fuel Type	Equipment Engine Size (hp)	Total Daily Operation of All Units (hr/day)	Daily Emissions (lbs/day)					Emission Factor Reference	
				VOC	CO	NO _x	SO ₂	PM	Equipment Type	Size
2 TON FLATBED W/10 TON CRANE	Diesel	350	0	0.0	0.0	0.0	0.000	0.0	Cranes	Max. hp 500
3 AXL FLATBED W/12+ TON CRANE	Diesel	350	4	0.7	2.5	6.6	0.007	0.3	Cranes	Max. hp 500
FORKLIFT, 8000+ LBS	Diesel	110	0	0.0	0.0	0.0	0.000	0.0	Forklifts	Max. hp 120
571G PIPELAYER-CAT	Diesel	310	0	0.0	0.0	0.0	0.000	0.0	Crawler Tractors	Max. hp 500
572G PIPELAYER-CAT	Diesel	200	8	1.6	4.4	14.6	0.015	0.6	Crawler Tractors	Max. hp 250
TRENCHING MACHINE	Diesel	180	0	0.0	0.0	0.0	0.0	0.0	Trenchers	Max. hp 250
315CL EXCAVATOR-CAT W/COMP. WHEEL	Diesel	115	0	0.0	0.0	0.0	0.000	0.0	Excavators	Max. hp 120
330BL EXCAVATOR-CAT	Diesel	204	0	0.0	0.0	0.0	0.000	0.0	Excavators	Max. hp 250
16-30 BENDING MACHINE-CRC	Diesel	100	0	0.0	0.0	0.0	0.000	0.0	Other Construction Equipment	Max. hp 120
420D BACKHOE-CAT	Diesel	93	0	0.0	0.0	0.0	0.000	0.0	Tractors/Loaders/Backhoes	Max. hp 120
430D BACKHOE-CAT	Diesel	102	6	0.5	2.2	3.2	0.004	0.3	Tractors/Loaders/Backhoes	Max. hp 120
OZZIE PADDER	Diesel	325	0	0.0	0.0	0.0	0.000	0.0	Other Construction Equipment	Max. hp 500
936E WHEEL LOADER 3YD-CAT	Diesel	140	0	0.0	0.0	0.0	0.000	0.0	Rubber Tired Loaders	Max. hp 175
950G WHEEL LOADER 4YD-CAT	Diesel	197	0	0.0	0.0	0.0	0.000	0.0	Rubber Tired Loaders	Max. hp 250
RT-630 CRANE-GROVE	Diesel	160	0	0.0	0.0	0.0	0.000	0.0	Cranes	Max. hp 175
RT-860B CRANE-GROVE	Diesel	190	4	0.5	1.3	4.6	0.005	0.2	Cranes	Max. hp 250
P/33/24 TRENCH COMPACTOR-RAMMEX	Diesel	18	0	0.0	0.0	0.0	0.000	0.0	Other Construction Equipment	Max. hp 25
P185 WD AIR COMPRESSOR-IR	Diesel	78	8	0.8	2.7	4.5	0.004	0.4	Air Compressors	Max. hp. 50
390 AIR COMPRESSOR-QUINCY	Diesel	37	4	0.4	1.1	0.9	0.001	0.1	Air Compressors	Max. hp. 50
1500 AIR COMPRESSOR-IR	Diesel	460	16	2.9	9.9	32.9	0.036	1.1	Air Compressors	Max. hp. 500
SA250 WELD MACHINE-LINCOLN	Diesel	40	24	2.8	7.1	6.4	0.008	0.7	Welders	Max. hp. 50
60KW GENERATOR-IR	Diesel	72	0	0.0	0.0	0.0	0.000	0.0	Generators	Max. hp. 120
G115KW GENERATOR-IR	Diesel	125	16	2.1	8.0	13.8	0.015	1.1	Generators	Max. hp. 120
G260KW GENERATOR-IR	Diesel	310	16	3.4	13.0	44.7	0.053	1.3	Generators	Max. hp. 500
3" PUMP MQ	Gas	4	0	0.0	0.0	0.0	0.000	0.0	Pumps	Max. hp 15
CD150M 6" PUMP-GODWIN	Diesel	90	0	0.0	0.0	0.0	0.000	0.0	Pumps	Max. hp 120
ASPHALT ZIPPER 480	Diesel	110	0	0.0	0.0	0.0	0.000	0.0	Pavers	Max. hp 120
8-HC SWEEPER-LAYMOR	Diesel	30	0	0.0	0.0	0.0	0.0	0.0	Sweepers	Max. hp 50
3-5 TON SMOOTH DRUM ROLLER	Diesel	43	0	0.0	0.0	0.0	0.0	0.0	Rollers	Max. hp 50
CONCRETE-AC.SAW	Diesel	5	0	0.0	0.0	0.0	0.0	0.0	Concrete Saws	Max. hp 25
TOTAL				16	52	132	0.15	6.0	-	-

Table 5
Fugitive Dust Emissions - Pipe Installation During Street Work Spread
Calnev Expansion Project

Construction Spread/Crew	Disturbance (acres)	Duration of Activity (months)	Emission Factor^a (ton/acre/month)		Daily Emissions (lbs/day)	
			PM₁₀	PM_{2.5}	PM₁₀	PM_{2.5}
Street Work Spread During Pipe Installation ^b	0.7	5.6	0.110	0.0231	7.0	1.5

Notes:

- a. See emission factor derivation table below.
- b. Pipeline installation over a total surface area of a 50-ft wide corridor with a length of 600 ft.

Emission Factor Derivation Table

Parameter	Units¹	PM₁₀⁽²⁾	PM_{2.5}⁽³⁾
Uncontrolled Emission Factor	ton/acre/month	0.22	0.046
Controlled Emission Factor ⁴	ton/acre/month	0.11	0.023

Notes:

- 1. Based on 22 days/month.
- 2. from UREMIS2007 User's Guide
- 3. assumes PM2.5 fraction is 21% of PM10 fraction.
- 4. Assume 50% dust control based on watering.

APPENDIX B
DETAILED OPERATIONAL EMISSION CALCULATIONS

Calnev Pipeline Expansion Project
Summary- Operational Emissions for General Conformity
(2012/10/09)

8-Hour Ozone (2008) Area	Nonattainment Status	Net Increase						Applicable General Conformity Threshold for VOC (ton/year)	Exceed Threshold?
		Numbers of Flanges	Numbers of Thread Connectors	Numbers of Valves	Numbers of Pumps	Numbers of Sump Tanks	Estimated Net Fugitive VOC Emissions (Controlled) (tons/year)		
Los Angeles-South Coast Air Basin, CA	Nonattainment	121	267	199	4	0	0.45	10	No
Los Angeles-San Bernardino Counties (West Mojave Desert), CA	Nonattainment	3	42	39	1	1	0.08	25	No
Remainder of Mojave Desert Area	Attainment	85	225	167	6	1	0.39	NA	NA
Clark County, NV	Attainment	11	142	67	0	2	0.22	NA	NA
Project Total	NA	220	676	472	11	4	1.14	NA	NA

NOTE:

1. All estimated emissions are based on the component counts from PID and drawing files (URS/Kinder Morgan 2009)
 NA: Not applicable.
2. Because Calnev is an existing pipeline and the proposed project is mainly the expansion by increasing the capacity, the usage of maintenance mobile sources remain the same with or without project. Therefore, there's no net increase emissions from mobile sources during project operation.

Calnev Pipeline Expansion Project

Summary- Operational Emissions for General Conformity

(2012/10/09)

Area	P&ID/Site plan #	Size (inch)	Flange	Thread connector	Valve	Pump	Sump Tank	Equipment ID	Installation	Notes	Fuel	Existing or New	Estimated Fugitive VOC Emissions (lb/day)	Estimated Fugitive VOC Emissions (ton/year)
SCAB - Colton terminal and station	D-CO3-08006	12	6		3				Vault	12" flanged plug valve	any	New	9.37E-03	1.71E-03
SCAB - Colton terminal and station	D-CO3-08006	2	2		1				Vault	2" ball valve (thread or weld)	any	New	3.12E-03	5.70E-04
SCAB - Colton terminal and station	D-CO3-08006	1	2		3				Vault	plug valve drain (could be 1" or 1/2")	any	New	7.67E-03	1.40E-03
SCAB - Colton terminal and station	D-CO3-08007	16x14	2		0	1	P-139	Aboveground	200 HP booster pump with seal/lube system and flanged in/out connection.	any	New	2.94E-02	5.37E-03	
SCAB - Colton terminal and station	D-CO3-08007	10	2		1				Aboveground	10" flanged gate valve	any	New	3.12E-03	5.70E-04
SCAB - Colton terminal and station	D-CO3-08007	10	2		1				Aboveground	10" flanged check valve	any	New	3.12E-03	5.70E-04
SCAB - Colton terminal and station	D-CO3-08007	1		14	7				Aboveground	1" weld (thread) ball valve	any	New	1.12E-01	2.05E-02
SCAB - Colton terminal and station	D-CO3-08007	1		4	2				Aboveground	1" PSV (Pressure release valve)	any	New	3.21E-02	5.85E-03
SCAB - Colton terminal and station	D-CO3-08008	10	2		1				Aboveground	10" flanged gate valve	any	New	3.12E-03	5.70E-04
SCAB - Colton terminal and station	D-CO3-08008	10	2		1				Aboveground	10" flanged check valve	any	New	3.12E-03	5.70E-04
SCAB - Colton terminal and station	D-CO3-08008	1		2	1				Aboveground	1" weld (thread) ball valve	any	New	1.60E-02	2.93E-03
SCAB - Colton terminal and station	D-CO3-08008	10x10	2			1	P-111	Aboveground	200 HP booster pump with seal/lube system and flanged in/out connection.	any	New	2.94E-02	5.37E-03	
SCAB - Colton terminal and station	D-CO3-08008A	10x12	2			1	P-111	Aboveground	100 HP booster pump with seal/lube system and flanged in/out connection and replaced with P-111.	any	Existing	2.94E-02	5.37E-03	
SCAB - Colton terminal and station	D-CO3-08008A	10	2		1				Aboveground	10" weld plug valve and will be demolished.	any	Existing	3.12E-03	5.70E-04
SCAB - Colton terminal and station	D-CO3-08008A	12	2		1				Aboveground	12" weld gate valve and will be demolished.	any	Existing	3.12E-03	5.70E-04
SCAB - Colton terminal and station	D-CO3-08009	10	1						Aboveground	Spectacle blind	any	New	4.23E-04	7.73E-05
SCAB - Colton terminal and station	D-CO3-08009	12	1						Aboveground	Spectacle blind	any	New	4.23E-04	7.73E-05
SCAB - Colton terminal and station	D-CO3-08009	12	2		1				Aboveground	12" flanged gate valve	any	New	3.12E-03	5.70E-04
SCAB - Colton terminal and station	D-CO3-08009	10x12	2			1	P-38	Aboveground	200 HP booster pump with seal/lube system and flanged in/out connection. Used to replaced existing P-0016	any	New	2.94E-02	5.37E-03	
SCAB - Colton terminal and station	D-CO3-08009A	10x12	2			1	P-0016	Aboveground	100 HP booster pump with seal/lube system and flanged in/out connection and will be replaced by P-38	any	Existing	2.94E-02	5.37E-03	
SCAB - Colton terminal and station	D-CO3-08009A	12	2		1				Aboveground	12" check valve (weld), will be demolished.	any	Existing	3.12E-03	5.70E-04
SCAB - Colton terminal and station	D-CO3-08010	12	2		1		PRV-203	Aboveground	Prover main flanges Assume to be 12"	any	New	3.12E-03	5.70E-04	
SCAB - Colton terminal and station	D-CO3-08010	8	4		1				Aboveground	8" 4-way diverter valve (4 flange connection), part of Prover	any	New	3.97E-03	7.24E-04
SCAB - Colton terminal and station	D-CO3-08010	2		8	4				Aboveground	2" ball valve (thread or weld), part of Prover	any	New	6.41E-02	1.17E-02
SCAB - Colton terminal and station	D-CO3-08010	2		4	2				Aboveground	2" plug valve (thread or weld), part of Prover	any	New	3.21E-02	5.85E-03
SCAB - Colton terminal and station	D-CO3-08010	1		10	5				Aboveground	1" plug valve (thread or weld), part of Prover	any	New	8.02E-02	1.46E-02
SCAB - Colton terminal and station	D-CO3-08010	1		2	1				Aboveground	1" PSV, part of Prover	any	New	1.60E-02	2.93E-03
SCAB - Colton terminal and station	D-CO3-08010	10	2				S-206	Aboveground	10" strainer, flanged connection with top flange	any	New	8.47E-04	1.55E-04	
SCAB - Colton terminal and station	D-CO3-08010	2		4	2				Aboveground	Strainer drain valve and a plugged vent valve, likely thread ball valve	any	New	3.21E-02	5.85E-03
SCAB - Colton terminal and station	D-CO3-08010	1		32	16				Aboveground	1" threaded ball valve in various locations.	any	New	2.57E-01	4.68E-02
SCAB - Colton terminal and station	D-CO3-08010	6	4				FT-335	Aboveground	6" Meter system, could include 4 pairs flange connection	any	New	1.69E-03	3.09E-04	
SCAB - Colton terminal and station	D-CO3-08010	10	8		4				Aboveground	10" flanged gate valve	any	New	1.25E-02	2.28E-03
SCAB - Colton terminal and station	D-CO3-08010	8			2				Aboveground	8" weld plug valves	any	New	4.55E-03	8.30E-04
SCAB - Colton terminal and station	D-CO3-08010	10			1				Aboveground	10" weld plug valve	any	New	2.28E-03	4.15E-04
SCAB - Colton terminal and station	D-CO3-08011	6x8	2			1	P-201	Aboveground	2500HP pump, with 8" and 6" flanged in/out connection	any	New	2.94E-02	5.37E-03	
SCAB - Colton terminal and station	D-CO3-08011	10	4		2				Aboveground	10" flanged gate valves	any	New	6.24E-03	1.14E-03
SCAB - Colton terminal and station	D-CO3-08011	6	4		2				Aboveground	6" flanged gate valves	any	New	6.24E-03	1.14E-03
SCAB - Colton terminal and station	D-CO3-08011	6	2		1				Aboveground	6" flanged ball valves	any	New	3.12E-03	5.70E-04
SCAB - Colton terminal and station	D-CO3-08011	2	4		2				Aboveground	2" flanged ball valves	any	New	6.24E-03	1.14E-03
SCAB - Colton terminal and station	D-CO3-08011	2		4	2				Aboveground	2" threaded ball valve (plugged)	any	New	3.21E-02	5.85E-03
SCAB - Colton terminal and station	D-CO3-08011	1		28	14				Aboveground	1" threaded ball valve (some are plugged)	any	New	2.24E-01	4.10E-02
SCAB - Colton terminal and station	D-CO3-08011	1		2	1				Aboveground	1" PSV (PSV-386)	any	New	1.60E-02	2.93E-03
SCAB - Colton terminal and station	D-CO3-08012	6x8	2			1	P-202	Aboveground	1000HP pump, with 8" and 6" flanged in/out connection. With seal and lube system	any	New	2.94E-02	5.37E-03	
SCAB - Colton terminal and station	D-CO3-08012	10	4		2				Aboveground	10" flanged gate valves	any	New	6.24E-03	1.14E-03
SCAB - Colton terminal and station	D-CO3-08012	10	2		1				Aboveground	10" flanged check valve	any	New	3.12E-03	5.70E-04
SCAB - Colton terminal and station	D-CO3-08012	2		2	1				Aboveground	2" threaded ball valve (plugged)	any	New	1.60E-02	2.93E-03
SCAB - Colton terminal and station	D-CO3-08012	1		28	14				Aboveground	1" threaded ball valve (some are plugged)	any	New	2.24E-01	4.10E-02
SCAB - Colton terminal and station	D-CO3-08012	1		2	2				Aboveground	1" PSV (PSV-386)	any	New	1.83E-02	3.34E-03

SCAB - Colton terminal and station	D-CO3-08016	8	4	2			Aboveground	8" Flanged gate valves	any	New	6.24E-03	1.14E-03	
SCAB - Colton terminal and station	D-CO3-08016	10	2	1			Aboveground	10" Flanged check valve	any	New	3.12E-03	5.70E-04	
SCAB - Colton terminal and station	D-CO3-08016	10	2	1			Aboveground	10" Flanged gate valve	any	New	3.12E-03	5.70E-04	
SCAB - Colton terminal and station	D-CO3-08016	14	2	1			Aboveground	14" Flanged gate valve	any	New	3.12E-03	5.70E-04	
SCAB - Colton terminal and station	D-CO3-08016	4	4	2			Aboveground	4" Flanged gate valves	any	New	6.24E-03	1.14E-03	
SCAB - Colton terminal and station	D-CO3-08016	4	2	1			Aboveground	4" weld globe valve	any	New	3.12E-03	5.70E-04	
SCAB - Colton terminal and station	D-CO3-08016	2	2	1			Aboveground	2" flanged ball valve	any	New	3.12E-03	5.70E-04	
SCAB - Colton terminal and station	D-CO3-08016	1		4	2		Aboveground	1" weld (or thread) globe valve	any	New	3.21E-02	5.85E-03	
SCAB - Colton terminal and station	D-CO3-08016	1		8	4		Aboveground	1" thread (weld) ball valve	any	New	6.41E-02	1.17E-02	
SCAB - Colton terminal and station	D-CO3-08016A	4	2	1			Aboveground	4" flanged ball valve and will be demolished	any	Existing	3.12E-03	5.70E-04	
SCAB - Colton terminal and station	D-CO3-08016A	14	2	1			Aboveground	14" Flanged gate valve and will be demolished	any	Existing	3.12E-03	5.70E-04	
SCAB - Colton terminal and station	D-CO3-08016A	1		2	1		Aboveground	1" thread (weld) gate valve and will be demolished	any	Existing	1.60E-02	2.93E-03	
SCAB - Colton terminal and station	D-CO3-08016A	1		2	1		Aboveground	1" thread (weld) check valve and will be demolished	any	Existing	1.60E-02	2.93E-03	
SCAB - Colton terminal and station	D-CO3-08017	16		1			Aboveground	16" weld gate valve	any	New	2.28E-03	4.15E-04	
SCAB - Colton terminal and station	D-CO3-08017	16	2	2			Aboveground	16" flanged gate valve	any	New	5.40E-03	9.85E-04	
SCAB - Colton terminal and station	D-CO3-08017	16		1			Aboveground	16" weld check valve	any	New	2.28E-03	4.15E-04	
SCAB - Colton terminal and station	D-CO3-08017	8	2	1			Aboveground	8"flanged gate valve	any	New	3.12E-03	5.70E-04	
SCAB - Colton terminal and station	D-CO3-08017	4		1			Aboveground	4" weld ball valve	any	New	2.28E-03	4.15E-04	
SCAB - Colton terminal and station	D-CO3-08017	2	6	3			Aboveground	2"flanged ball valve	any	New	9.37E-03	1.71E-03	
SCAB - Colton terminal and station	D-CO3-08017	1		18	9		Aboveground	1"thread ball valve	any	New	1.44E-01	2.63E-02	
SCAB - Colton terminal and station	D-CO3-08017	1		8	4		Aboveground	1"thread check valve	any	New	6.41E-02	1.17E-02	
SCAB - Colton terminal and station	D-CO3-08017	1		4	2		Aboveground	1"thread globe valve	any	New	3.21E-02	5.85E-03	
SCAB - Colton terminal and station	D-CO3-08017	20	1		2		Aboveground	Pig launcher/receiver for 16" pipe. assume 20" quick enclosure	any	New	4.97E-03	9.08E-04	
SCAB - Colton terminal and station	D-CO3-08018	3	4	4			Aboveground	3" blind flanges (blind existing valve. May not be counted as new)	any	New	1.08E-02	1.97E-03	
SCAB - Colton terminal and station	D-CO3-08018	6	2	2			Aboveground	6" blind flanges (blind existing valve. May not be counted as new)	any	New	5.40E-03	9.85E-04	
SCAB - Colton terminal and station	D-CO3-08018A	6		7			Aboveground	6" weld valves and will be demolished	any	Existing	1.59E-02	2.91E-03	
SCAB - Colton terminal and station	D-CO3-08018A	3	2	1			Aboveground	3" PCV weld valve and will be demolished	any	Existing	3.12E-03	5.70E-04	
SCAB - Colton terminal and station	D-CO3-08018A	3	4	2			Aboveground	3" flanged check valve and will be demolished	any	Existing	6.24E-03	1.14E-03	
SCAB - Colton terminal and station	D-CO3-08018A	3		2	1		Aboveground	3" plug weld valve and will be demolished	any	Existing	1.60E-02	2.93E-03	
SCAB - Colton terminal and station	D-CO3-08018A	6		7			Aboveground	6" check valve (weld) valves and will be demolished	any	Existing	1.59E-02	2.91E-03	
SCAB - Colton terminal and station	D-CO3-08018A	6		3			Aboveground	6" gate valve (weld) valves and will be demolished	any	Existing	6.83E-03	1.25E-03	
SCAB - Colton terminal and station	D-CO3-08018A	4		2			Aboveground	4" gate valve (weld) valves and will be demolished	any	Existing	4.55E-03	8.30E-04	
SCAB - Colton terminal and station	D-CO3-08018A	6	4		1		Aboveground	6" meter system valves and will be demolished	any	Existing	3.97E-03	7.24E-04	
SCAB - Colton terminal and station	D-CO3-08018A	>1				1	Aboveground	Sump tank will be abandoned since all the in/out pipe will be demolished	any	Existing	2.79E-02	5.10E-03	
SCAB - Colton terminal and station	D-CO3-08019	>1				1	D-205	Aboveground	New sump tank (replace the one in D-CO3-08018A).	any	New	2.79E-02	5.10E-03
SCAB - Colton terminal and station	D-CO3-08019	3	2				DAR-447	Aboveground	Flame arrestor, 3" flange on both sides	any	New	8.47E-04	1.55E-04
SCAB - Colton terminal and station	D-CO3-08019	1		6	3			Aboveground	1" gate valve (thread)	any	New	4.81E-02	8.78E-03
SCAB - Colton terminal and station	D-CO3-08019	1		4	2			Aboveground	1" ball valve (thread)	any	New	3.21E-02	5.85E-03
SCAB - Colton terminal and station	D-CO3-08019	4	2	1				Aboveground	4" ball valve (flanged)	any	New	3.12E-03	5.70E-04
SCAB - Colton terminal and station	D-CO3-08019	4	2	1				Aboveground	4" check valve (flanged)	any	New	3.12E-03	5.70E-04
SCAB - Colton terminal and station	D-CO3-08019	4	2	1				Aboveground	4" PCV valve (flanged)(PCV-440)	any	New	3.12E-03	5.70E-04
SCAB - Colton terminal and station	D-CO3-08019	1		2	1			Aboveground	1" PSV (PSV-413)	any	New	1.60E-02	2.93E-03
SCAB - Colton terminal and station	D-CO3-08019	4	1			P-205	Aboveground	P-205 outlet flange	any	New	4.23E-04	7.73E-05	
SCAB - Mainline Valve (MP 0-23)	MP 0.1	16		1			MLV #4	Direct Burial	Gate Valve, 16"Class 600, Welded ends	any	New	2.28E-03	4.15E-04
SCAB - Mainline Valve (MP 0-23)	MP 2.7	16		1			MLV #2	Direct Burial	Check valve, Class 900 welded ends,	any	New	2.28E-03	4.15E-04
SCAB - Mainline Valve (MP 0-23)	MP 6.0	16		1			MLV #3	Direct Burial	Check valve, Class 900 welded ends,	any	New	2.28E-03	4.15E-04
SCAB - Mainline Valve (MP 0-23)	MP 10.3	16		1			MLV #4	Direct Burial	Gate Valve, 16"Class 600, Welded ends	any	New	2.28E-03	4.15E-04
SCAB - Mainline Valve (MP 0-23)	MP 13.0	16		1			MLV #5	Direct Burial	Gate Valve, 16"Class 600, Welded ends	any	New	2.28E-03	4.15E-04
SCAB - Mainline Valve (MP 0-23)	MP 13.0	16		1			MLV #6	Direct Burial	Check valve, Class 900 welded ends	any	New	2.28E-03	4.15E-04
SCAB - Mainline Valve (MP 0-23)	MP 16.6	16		1			MLV #7	Direct Burial	Gate Valve, 16"Class 600, Welded ends	any	New	2.28E-03	4.15E-04
SCAB - Mainline Valve (MP 0-23)	MP 16.6	16		1			MLV #8	Direct Burial	Check valve, Class 900 welded ends	any	New	2.28E-03	4.15E-04
SCAB - Mainline Valve (MP 0-23)	MP 20.6	16		1			MLV #9	Direct Burial	Check valve, Class 900 welded ends	any	New	2.28E-03	4.15E-04
SCAB - Mainline Valve (MP 0-23)		6		5				Direct Burial	6" gate valve (each mainline check valve comes with a 6" check valve)	any	New	1.14E-02	2.08E-03
SCAB - Mainline Valve (MP 0-23)		2		18	9			Direct Burial	2" TOR with cap, each valve has two.	any	New	1.44E-01	2.63E-02
TOTAL EXISTING		24	6	31	2	1						2.07E-01	3.78E-02
TOTAL NEW*		145	273	230	6	1						2.66E+00	4.86E-01
NET INCREASE		121	267	199	4	0						2.45E+00	4.48E-01

NOTES

only valve size >=1" is considered here.
For no flange connection valve, it is >= 3", assume weld connection, or thread connection.
For pump, the lube oil system and seal fluid system is included the pump package. Neglect all the connection since they are less than 1"
Ground drain valve is not included since the valve have negligible emission compared to open gravity drain
The plug valve (ball, gate) could have flange connection depend on the valve model and vendor.
The pressure sensors line and lube injection line associated mainline valve is neglected since they are less than 1" for typical design.
Area 1 is from MP 0-23 up to Bastow station inlet.
All the information and data identified above are from the design PID and drawing in 2008. They may be changed in the final design.
* A 25% component counts buffer were added into the total new component in order to be conservative included the possible changes in the final designs of pipeline. (add 1 for the component with 0 total count)

Calnev Pipeline Expansion Project

Summary- Operational Emissions for General Conformity

(2012/10/09)

Calnev Pipeline Expansion Project

Summary- Operational Emissions for General Conformity

(2012/10/09)

Area	P&ID/Site plan #	Size (inch)	Flange	Thread connector	Valve	Pump	Sump Tank	Equipment ID	Installation	Notes	Fuel	Existing or New	Estimated Fugitive VOC Emissions (lb/day)	Estimated Fugitive VOC Emissions (ton/year)
EMDAB-Barstow terminal	D-BW3-08005	16			3					16" mainline gate vale MP92.75 and MP92.79	any	New	6.83E-03	1.25E-03
EMDAB-Barstow terminal	D-BW3-08005	12			1					12"gate vale (welded connection)	any	New	2.28E-03	4.15E-04
EMDAB-Barstow terminal	D-BW3-08005	8	2		1					8"flanged gate vale	any	New	3.12E-03	5.70E-04
EMDAB-Barstow terminal	D-BW3-08005	6	2		1					6"flanged gate vale	any	New	3.12E-03	5.70E-04
EMDAB-Barstow terminal	D-BW3-08005	6	2		1					6" PSV (assume flanged connection)	any	New	3.12E-03	5.70E-04
EMDAB-Barstow terminal	D-BW3-08005	12	2							12" blind flange	any	New	8.47E-04	1.55E-04
EMDAB-Barstow terminal	D-BW3-08005	12			1					12" check valve	any	New	2.28E-03	4.15E-04
EMDAB-Barstow terminal	D-BW3-08005A	12			1					12" flange is blinded	any	Existing	2.28E-03	4.15E-04
EMDAB-Barstow terminal	D-BW3-08006	6/4				1	BT-P-100			new 1000 HP boost pump.	any	New	2.86E-02	5.21E-03
EMDAB-Barstow terminal	D-BW3-08006A	6/4				1	BT-P-100			Remove existing 1000 HP boost pump.	any	Existing	2.86E-02	5.21E-03
EMDAB-Yermo Station	D-YE-300	10	2		1					10" flanged gate valve	any	New	3.12E-03	5.70E-04
EMDAB-Yermo Station	D-YE-300	10	1							10" blind flange	any	New	4.23E-04	7.73E-05
EMDAB-Yermo Station	D-YE-300	10	2		1					10" flanged valve and could be removed and blinded	any	Existing	3.12E-03	5.70E-04
EMDAB-Baker Station	D-BA3-08005	6/8	2			1	BK-P-101			New pump	any	New	2.94E-02	5.37E-03
EMDAB-Baker Station	D-BA3-08005	8	1							8" flanges	any	New	4.23E-04	7.73E-05
EMDAB-Baker Station	D-BA3-08005	1		16	8					1" ball valves (some with plug)	any	New	1.28E-01	2.34E-02
EMDAB-Baker Station	D-BA3-08005	1		2	1					1" PSV	any	New	1.60E-02	2.93E-03
EMDAB-Baker Station	D-BA3-08005A	10/12				1	BK-P-101			Remove existing pump	any	Existing	2.86E-02	5.21E-03
EMDAB-Baker Station	D-BA3-08005A	12	1							Remove 12" flanges	any	Existing	4.23E-04	7.73E-05
EMDAB-Baker Station	D-BA3-08006	6/8	2			1	BK-P-101			New pump	any	New	2.94E-02	5.37E-03
EMDAB-Baker Station	D-BA3-08006	8	1							8" flanges	any	New	4.23E-04	7.73E-05
EMDAB-Baker Station	D-BA3-08006	1		16	8					1" ball valves (some with plug)	any	New	1.28E-01	2.34E-02
EMDAB-Baker Station	D-BA3-08006	1		2	1					1" PSV	any	New	1.60E-02	2.93E-03
EMDAB-Baker Station	D-BA3-08006A	10/12				1	BK-P-102			Remove existing pump	any	Existing	2.86E-02	5.21E-03
EMDAB-Baker Station	D-BA3-08006A	12	1							Remove 12" flanges	any	Existing	4.23E-04	7.73E-05
EMDAB-Baker Station	D-BA3-08007	6/8	2			1	BK-P-101			New pump	any	New	2.94E-02	5.37E-03
EMDAB-Baker Station	D-BA3-08007	8	1							8" flanges	any	New	4.23E-04	7.73E-05
EMDAB-Baker Station	D-BA3-08007	1		16	8					1" ball valves (some with plug)	any	New	1.28E-01	2.34E-02
EMDAB-Baker Station	D-BA3-08007	1		2	1					1" PSV	any	New	1.60E-02	2.93E-03
EMDAB-Baker Station	D-BA3-08007A	10/12				1	BK-P-102			Remove existing pump	any	Existing	2.86E-02	5.21E-03
EMDAB-Baker Station	D-BA3-08007A	12	1							Remove 12" flanges	any	Existing	4.23E-04	7.73E-05
EMDAB-Baker Station	D-BA3-08008	2	1							2" blind flange	any	Existing	4.23E-04	7.73E-05
EMDAB-Baker Station	D-BA3-08008	2	2							Remove 2" check valve	any	Existing	8.47E-04	1.55E-04
EMDAB-Silver Lake Pump Station	D-SK3-08006	16	2		1					16" mainline flanged gate valve	any	New	3.12E-03	5.70E-04
EMDAB-Silver Lake Pump Station	D-SK3-08006	16	2		1					16" flanged check valve	any	New	3.12E-03	5.70E-04
EMDAB-Silver Lake Pump Station	D-SK3-08006	12	4		2					12" flanged gate valve	any	New	6.24E-03	1.14E-03
EMDAB-Silver Lake Pump Station	D-SK3-08006	12	2		1					12" flanged check valve	any	New	3.12E-03	5.70E-04
EMDAB-Silver Lake Pump Station	D-SK3-08006	12	2							12" flange pairs	any	New	8.47E-04	1.55E-04
EMDAB-Silver Lake Pump Station	D-SK3-08006	8	4		2					8" flanged gate valve	any	New	6.24E-03	1.14E-03
EMDAB-Silver Lake Pump Station	D-SK3-08006	8	2		1					8" flanged ball valve	any	New	3.12E-03	5.70E-04
EMDAB-Silver Lake Pump Station	D-SK3-08006	10/12	2			1	SK-P-102			2750HP pump	any	New	2.94E-02	5.37E-03
EMDAB-Silver Lake Pump Station	D-SK3-08006	2		2	1					2" ball valve	any	New	1.60E-02	2.93E-03
EMDAB-Silver Lake Pump Station	D-SK3-08006	1		16	8					1" ball valve	any	New	1.28E-01	2.34E-02
EMDAB-Silver Lake Pump Station	D-SK3-08006	1		2	1					1" PSV	any	New	1.60E-02	2.93E-03
EMDAB-Silver Lake Pump Station	D-SK3-08007	16	2		1					16" flanged check valve	any	New	3.12E-03	5.70E-04
EMDAB-Silver Lake Pump Station	D-SK3-08007	10/12	2			1	SK-P-103			3500HP pump	any	New	2.94E-02	5.37E-03

EMDAB-Silver Lake Pump Station	D-SK3-08007	12	2						12" flange pairs	any	New	8.47E-04	1.55E-04
EMDAB-Silver Lake Pump Station	D-SK3-08007	12	4		2				12" flanged gate valve	any	New	6.24E-03	1.14E-03
EMDAB-Silver Lake Pump Station	D-SK3-08007	12	2		1				12" flanged check valve	any	New	3.12E-03	5.70E-04
EMDAB-Silver Lake Pump Station	D-SK3-08007	2		2	1				2" ball valve	any	New	1.60E-02	2.93E-03
EMDAB-Silver Lake Pump Station	D-SK3-08007	1		16	8				1" ball valve	any	New	1.28E-01	2.34E-02
EMDAB-Silver Lake Pump Station	D-SK3-08007	1		4	2				1" PSV	any	New	3.21E-02	5.85E-03
EMDAB-Silver Lake Pump Station	D-SK3-08008	20	1				Pig barrel		20" quick enclosure	any	New	4.23E-04	7.73E-05
EMDAB-Silver Lake Pump Station	D-SK3-08008					1	D-701		100 BBL (9'Dx10'H) sump tank	any	New	2.79E-02	5.10E-03
EMDAB-Silver Lake Pump Station	D-SK3-08008	2	1			1	SK-P-701		1/3HP pump	any	New	2.90E-02	5.29E-03
EMDAB-Silver Lake Pump Station	D-SK3-08008	1.5/1	2			1	SK-P-702		15 HP pump	any	New	2.94E-02	5.37E-03
EMDAB-Silver Lake Pump Station	D-SK3-08008	16	8		4				16" flanged gate valve (Pig outlets).	any	New	1.25E-02	2.28E-03
EMDAB-Silver Lake Pump Station	D-SK3-08008	16			1				16" check valve (Pig outlets), seem welded.	any	New	2.28E-03	4.15E-04
EMDAB-Silver Lake Pump Station	D-SK3-08008	16	1						16" insulation joint	any	New	4.23E-04	7.73E-05
EMDAB-Silver Lake Pump Station	D-SK3-08008	2		6	3				2" ball valve	any	New	4.81E-02	8.78E-03
EMDAB-Silver Lake Pump Station	D-SK3-08008	1.5	2		1				1.5" ball valve	any	New	3.12E-03	5.70E-04
EMDAB-Silver Lake Pump Station	D-SK3-08008	1.5	3		1				1.5" strainer	any	New	3.55E-03	6.47E-04
EMDAB-Silver Lake Pump Station	D-SK3-08008	1		36	18				1" ball valve	any	New	2.89E-01	5.27E-02
EMDAB-Silver Lake Pump Station	D-SK3-08008	1		6	3				1"PSV	any	New	4.81E-02	8.78E-03
EMDAB-Silver Lake Pump Station	D-SK3-08008	1		8	4				1"check valve	any	New	6.41E-02	1.17E-02
									DRA skid, two 1" ball valve (the injection pump is less than 1", neglect here).				
EMDAB-Silver Lake Pump Station	D-SK3-08010	1		4	2					any	New	3.21E-02	5.85E-03
EMDAB-Silver Lake Pump Station	D-SK3-08010	1		2					DRA skid, two 1" insulation joint	any	New	1.38E-02	2.51E-03
EMDAB-Valley Wells Station	D-VW3-08005	14			2				14" gate valve	any	New	4.55E-03	8.30E-04
EMDAB-Valley Wells Station	D-VW3-08005	14			1				14" check valve	any	New	2.28E-03	4.15E-04
EMDAB-Valley Wells Station	D-VW3-08005	6	2		2				6" gate valve, one end flange	any	New	5.40E-03	9.85E-04
EMDAB-Valley Wells Station	D-VW3-08005	2	2		1				2" flanged ball valve	any	New	3.12E-03	5.70E-04
EMDAB-Valley Wells Station	D-VW3-08005	1		2	1				1" ball valve	any	New	1.60E-02	2.93E-03
EMDAB-Mainline valve	MP 99.9	16					MLV #26	Direct Burial	Gate	any	New	0.00E+00	0.00E+00
EMDAB-Mainline valve	MP 113.1	16					MLV #27	Direct Burial	Gate	any	New	0.00E+00	0.00E+00
EMDAB-Mainline valve	MP 121.3	16					MLV #28	Direct Burial	Gate	any	New	0.00E+00	0.00E+00
EMDAB-Mainline valve	MP 131.7	16					MLV #29	Direct Burial	Gate	any	New	0.00E+00	0.00E+00
EMDAB-Mainline valve	MP 142.4	16					MLV #30	Direct Burial	Gate	any	New	0.00E+00	0.00E+00
EMDAB-Mainline valve	MP 160.0	16					MLV #34	Direct Burial	Check	any	New	0.00E+00	0.00E+00
EMDAB-Mainline valve	MP 174.2	16					MLV #35	Direct Burial	Gate	any	New	0.00E+00	0.00E+00
EMDAB-Mainline valve	MP 178.5	16					MLV #36	Direct Burial	Check (seem in Valley wells station, but not in P&ID)	any	New	0.00E+00	0.00E+00
EMDAB-Mainline valve	MP 189.1	16					MLV #37	Direct Burial	Gate	any	New	0.00E+00	0.00E+00
EMDAB-Mainline valve	MP 194.2	16					MLV #38	Direct Burial	Gate	any	New	0.00E+00	0.00E+00
EMDAB-Mainline valve		6		2				Direct Burial	6" gate valve (each mainline check valve comes with a 6" check valve)	any	New	4.55E-03	8.30E-04
EMDAB-Mainline valve		2		20	20			Direct Burial	2" TOR with cap, each valve has two.	any	New	1.83E-01	3.34E-02
TOTAL EXISTING		8	0	2	4	0						1.22E-01	2.23E-02
TOTAL NEW*		93	225	169	10	1						2.29E+00	4.17E-01
NET INCREASE		85	225	167	6	1						2.16E+00	3.95E-01

NOTES

only valve size >=1" is considered here.
For no flange connection valve, it is >= 3", assume weld connection, or thread connection.
For pump, the lube oil system and seal fluid system is included the pump package. Neglect all the connection since they are less than 1"
Ground drain valve is not included since the valve have negligible emission compared to open gravity drain
The plug valve (ball, gate) could have flange connection depend on the valve model and vendor.
The pressure sensors line and lube injection line associated mainline valve is neglected since they are less than 1" for typical design.
Area 2B is from Barstow east to MP 195 (Barstow is not included).
DRA = drag reduction agent.
All the information and data identified above are from the design PID and drawing in 2008. They may be changed in the final design.
* A 25% component counts buffer were added into the total new component in order to be conservative included the possible changes in the final designs of pipeline.(add 1 for the component with 0 total count)

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(2012/10/09)

Area	P&ID/Site plan #	Size (inch)	Flange	Thread connector	Valve	Pump	Sump Tank	Equipment ID	Installation	Notes	Fuel	Existing or New	Estimated Fugitive VOC Emissions (lb/day)	Estimated Fugitive VOC Emissions (ton/year)
CC-Branken Junction (New)	D-XXX-300A	18	1					Launcher 1#		18" quick enclosure for Pig #1 (14" line)	Gas/Diesel	New	4.23E-04	7.73E-05
CC-Branken Junction (New)	D-XXX-300A	20	1					Receiver 1#		20" quick enclosure for Pig #1 (16" line)	Gas/Diesel	New	4.23E-04	7.73E-05
CC-Branken Junction (New)	D-XXX-300A	16	4		3					16" valve, one is welded connection	Gas/Diesel	New	8.52E-03	1.55E-03
CC-Branken Junction (New)	D-XXX-300A	14	4		3					14" valve, one is welded connection	Gas/Diesel	New	8.52E-03	1.55E-03
CC-Branken Junction (New)	D-XXX-300A	12	1		1					12" valve, one end is flange or blinded?	Gas/Diesel	New	2.70E-03	4.92E-04
CC-Branken Junction (New)	D-XXX-300A	8	4		2					8" flanged gate valves	Gas/Diesel	New	6.24E-03	1.14E-03
CC-Branken Junction (New)	D-XXX-300A	2		6	3					2" ball valves	Gas/Diesel	New	4.81E-02	8.78E-03
CC-Branken Junction (New)	D-XXX-300A	1		32	16					1" ball valves	Gas/Diesel	New	2.57E-01	4.68E-02
CC-Branken Junction (New)	D-XXX-300B	12	1					Launcher 2#		12" quick enclosure for Pig #2 (8" line)	JP-8	New	4.23E-04	7.73E-05
CC-Branken Junction (New)	D-XXX-300B	16	1					Launcher 3#		16" quick enclosure for Pig #2 (12" line)	JP-8	New	4.23E-04	7.73E-05
CC-Branken Junction (New)	D-XXX-300B	18	1					Receiver 2#		18" quick enclosure for Pig #2 (14" line)	JP-8	New	4.23E-04	7.73E-05
CC-Branken Junction (New)	D-XXX-300B	4			2					4" gate valves, one size is not marked and assume it is 4"	JP-8	New	4.55E-03	8.30E-04
CC-Branken Junction (New)	D-XXX-300B	6			3					6" gate valves, one is PCV (welded?)	JP-8	New	6.83E-03	1.25E-03
CC-Branken Junction (New)	D-XXX-300B	8	8		5					8" flanged gate valves, one is welded	JP-8	New	1.48E-02	2.69E-03
CC-Branken Junction (New)	D-XXX-300B	12	4		3					12" flanged gate valves, one is welded	JP-8	New	8.52E-03	1.55E-03
CC-Branken Junction (New)	D-XXX-300B	14	4		3					14" flanged gate valves, one is welded	JP-8	New	8.52E-03	1.55E-03
CC-Branken Junction (New)	D-XXX-300B	2		8	4					2" ball valves	JP-8	New	6.41E-02	1.17E-02
CC-Branken Junction (New)	D-XXX-300B	1		46	23					1" ball valves	JP-8	New	3.69E-01	6.73E-02
CC-Branken Junction (New)	D-XXX-300B	1		8	4					1" PSV	JP-8	New	6.41E-02	1.17E-02
CC-Braken Junction (New)	D-XXX-300C						1 D-101			100 BBL sump tank	any	New	2.79E-02	5.10E-03
CC-Bracken Junction (DEMO)	D-BJ-300A	10	2					#1#2 pig		10" quick enclosure for Pig (8" line)	any	Existing	8.47E-04	1.55E-04
CC-Bracken Junction (DEMO)	D-BJ-300A	8	2					#1 pig		8" quick enclosure for Pig (6" line)	any	Existing	8.47E-04	1.55E-04
CC-Bracken Junction (DEMO)	D-BJ-300A	8			3					8" gate valve	any	Existing	6.83E-03	1.25E-03
CC-Bracken Junction (DEMO)	D-BJ-300A	6	1		8					6" gate valve, only one has one end flange	any	Existing	1.86E-02	3.40E-03
CC-Bracken Junction (DEMO)	D-BJ-300A	6			2					6" check valve	any	Existing	4.55E-03	8.30E-04
CC-Bracken Junction (DEMO)	D-BJ-300A	6	2					strainer		6" strainer	any	Existing	8.47E-04	1.55E-04
CC-Bracken Junction (DEMO)	D-BJ-300A	6	4		2					6" flange ball valve, one end flange	any	Existing	6.24E-03	1.14E-03
CC-Bracken Junction (DEMO)	D-BJ-300A	2		2	2					2" TOR with cap, each valve has two.	any	Existing	1.83E-02	3.34E-03
CC-Bracken Junction (DEMO)	D-BJ-300A	2	3		4					2" flange ball valve	any	Existing	1.04E-02	1.89E-03
CC-Bracken Junction (DEMO)	D-BJ-300A	3			1					3" flange ball valve	any	Existing	2.28E-03	4.15E-04
CC-Bracken Junction (DEMO)	D-BJ-300A	4	6		4					4" flange ball valve, one is one end flange	any	Existing	1.16E-02	2.12E-03
CC-Bracken Junction (DEMO)	D-BJ-300A	4	4		2			Meter		4 meter	any	Existing	6.24E-03	1.14E-03
CC-Bracken Junction (DEMO)	D-BJ-300A	1		64	32					1" ball valves	any	Existing	5.13E-01	9.36E-02
CC-Bracken Junction (DEMO)	D-BJ-300A	1		20	10					1" PSV	any	Existing	1.60E-01	2.93E-02
CC- McCarran Airport Terminal (D-MW-300B		10	4		3					10" gate valves	any	New	8.52E-03	1.55E-03
CC- McCarran Airport Terminal (D-MW-300B		10	2					Strainer		10" strainer	any	New	8.47E-04	1.55E-04
CC- McCarran Airport Terminal (D-MW-300B		8	2		1					8" flanged Gate valve	any	New	3.12E-03	5.70E-04
CC- McCarran Airport Terminal (D-MW-300B		2		8	4					2" ball valve	any	New	6.41E-02	1.17E-02
CC- McCarran Airport Terminal (D-MW-300B		2		2	1					2"check valve	any	New	1.60E-02	2.93E-03
CC- McCarran Airport Terminal (D-MW-300B							1 Sump tank			New sump tank (100BBL?)	any	New	2.79E-02	5.10E-03
CC- McCarran Airport Terminal (D-MW-300B		1		24	12					1" ball valve	any	New	1.92E-01	3.51E-02
CC- McCarran Airport Terminal (D-MW-300B		1		4	2					1" PSV	any	New	3.21E-02	5.85E-03
CC- McCarran Airport Terminal (D-MW-300B							MW-1			340 BBL relief tank, abandon in place	any	Existing	0.00E+00	0.00E+00
CC- McCarran Airport Terminal (D-MW-300B		4	4		2					4" gate valves, abandon in place	any	Existing	6.24E-03	1.14E-03
CC- McCarran Airport Terminal (D-MW-300B		2	4		2					2" gate valves, abandon in place	any	Existing	6.24E-03	1.14E-03
CC- McCarran Airport Terminal (D-MW-300B		2		2	1					2" check valves, abandon in place	any	Existing	1.60E-02	2.93E-03
CC- McCarran Airport Terminal (D-MW-300B		1		2	1					1" ball valves, abandon in place	any	Existing	1.60E-02	2.93E-03

CC- McCarran Airport Terminal (	D-MW-300B	2	2				Sight Glass		2" SIGHT GLASS abandon in place	any	Existing	8.47E-04	1.55E-04
CC- McCarran Airport Terminal (	D-MW-300B	2	2				Strainer		2" strainer, abandon in place	any	Existing	8.47E-04	1.55E-04
CC- McCarran Airport Terminal (	D-MW-300B	2			1		drain Pump		1 HP?, abandon in place	any	Existing	2.86E-02	5.21E-03
CC- McCarran Airport Terminal (	D-MW-300B(D)					1	Sump tank		Existing sump tank, to be demolished (100BBL?)	any	Existing	2.79E-02	5.10E-03
CC- McCarran Airport Terminal (	D-MW-300B(D)	6	2				Filter		6" Filter, to be demolished	any	Existing	8.47E-04	1.55E-04
CC- McCarran Airport Terminal (	D-MW-300B(D)	6			3				6" plug valve (welded?), to be demolished	any	Existing	6.83E-03	1.25E-03
CC- McCarran Airport Terminal (	D-MW-300B(D)	8	2				Strainer		8" Strainer, to be demolished	any	Existing	8.47E-04	1.55E-04
CC- McCarran Airport Terminal (	D-MW-300B(D)	4	2				Meter		4" Meter, to be demolished	any	Existing	8.47E-04	1.55E-04
CC- McCarran Airport Terminal (	D-MW-300B(D)	6	4		3				6" flanged ball valve, to be demolished	any	Existing	8.52E-03	1.55E-03
CC- McCarran Airport Terminal (	D-MW-300B(D)	6	2		1				6" PCV-201 (flanged?) valve, to be demolished	any	Existing	3.12E-03	5.70E-04
CC- McCarran Airport Terminal (	D-MW-300B(D)	6			5				6" Gate valve, to be demolished	any	Existing	1.14E-02	2.08E-03
CC- McCarran Airport Terminal (	D-MW-300B(D)	6	1						6" blind flange, to be demolished	any	Existing	4.23E-04	7.73E-05
CC- McCarran Airport Terminal (	D-MW-300B(D)	2	2						2" blind flange, to be demolished	any	Existing	8.47E-04	1.55E-04
CC- McCarran Airport Terminal (	D-MW-300B(D)	4			1				4" ball valve, to be demolished	any	Existing	2.28E-03	4.15E-04
CC- McCarran Airport Terminal (	D-MW-300B(D)	2		2	1				2" gate valve, to be demolished	any	Existing	1.60E-02	2.93E-03
CC- McCarran Airport Terminal (	D-MW-300B(D)	2		2	1				2" plug valve, to be demolished	any	Existing	1.60E-02	2.93E-03
CC- McCarran Airport Terminal (	D-MW-300B(D)	1		14	7				1" ball valve, to be demolished	any	Existing	1.12E-01	2.05E-02
CC- McCarran Airport Terminal (	D-MW-300B(D)		2				Prover		Prover end flange	any	Existing	8.47E-04	1.55E-04
CC- McCarran Airport Terminal (	D-MW-300B(D)		4		1				Prover 4 ways valve	any	Existing	3.97E-03	7.24E-04
CC- McCarran Airport Terminal (	D-MW-300C		2				Prover		New Prover end flange	any	New	8.47E-04	1.55E-04
CC- McCarran Airport Terminal (	D-MW-300C		4		1				New Prover 4 ways valve	any	New	3.97E-03	7.24E-04
CC- McCarran Airport Terminal (	D-MW-300C		4		2				Plug valve to Prover 4 ways valve	any	New	6.24E-03	1.14E-03
CC- McCarran Airport Terminal (	D-MW-300C	10	4		2				10" Plug valves	any	New	6.24E-03	1.14E-03
CC- McCarran Airport Terminal (	D-MW-300C	6	4				Meter		6" Meter (assume 4 flanges)	any	New	1.69E-03	3.09E-04
CC- McCarran Airport Terminal (	D-MW-300C	2		4	2				2" Check valves	any	New	3.21E-02	5.85E-03
CC- McCarran Airport Terminal (	D-MW-300C	2		4	2				2" plug valves	any	New	3.21E-02	5.85E-03
CC- McCarran Airport Terminal (	D-MW-300C	2		6	3				2" ball valves	any	New	4.81E-02	8.78E-03
CC- McCarran Airport Terminal (	D-MW-300C	1		26	13				1" ball valves	any	New	2.08E-01	3.80E-02
CC- McCarran Airport Terminal (	D-MW-300C	1		4	2				1" PSV valves	any	New	3.21E-02	5.85E-03
CC- Las Vegas Terminal	D-LV-00-300E17A	6			2				6" gate valve (welded)	any	New	4.55E-03	8.30E-04
CC- Las Vegas Terminal	D-LV-00-300E17A	6			3				6" ball valve (welded)	any	New	6.83E-03	1.25E-03
CC- Las Vegas Terminal	D-LV-00-300E17A	6	2				Filter		6" filter	any	New	8.47E-04	1.55E-04
CC- Las Vegas Terminal	D-LV-00-300E17A	2		2	1				2" ball valve	any	New	1.60E-02	2.93E-03
CC- Las Vegas Terminal	D-LV3-07038	1		6	3				1" ball valve, to be demolished	any	Existing	4.81E-02	8.78E-03
CC- Las Vegas Terminal	D-LV3-07038	1		2	1				1" PSV valve, to be demolished	any	Existing	1.60E-02	2.93E-03
CC- Las Vegas Terminal	D-LV3-07038B	8	4		5				8" gate valve (two is flanged)	any	New	1.31E-02	2.39E-03
CC- Las Vegas Terminal	D-LV3-07038B	8	2				Filter		8" filter (flanged)	any	New	8.47E-04	1.55E-04
CC- Las Vegas Terminal	D-LV3-07038B	10	1				Pig		10" quick enclosure for Pig (8" line)	any	New	4.23E-04	7.73E-05
CC- Las Vegas Terminal	D-LV3-07038B	4	1		1				4" ball valve	any	New	2.70E-03	4.92E-04
CC- Las Vegas Terminal	D-LV3-07038B	4	2						4" flange pair	any	New	8.47E-04	1.55E-04
CC- Las Vegas Terminal	D-LV3-07038B	1		38	19				1" ball valve	any	New	3.05E-01	5.56E-02
CC- Las Vegas Terminal	D-LV3-07038B	2	4		2				2" gate valve	any	New	6.24E-03	1.14E-03
CC- Las Vegas Terminal	D-LV3-07038B	1		6	3				1"PSV valve	any	New	4.81E-02	8.78E-03
CC- Las Vegas Terminal	D-LV3-07038C	8	4		2				8" gate valve	any	New	6.24E-03	1.14E-03
CC- Las Vegas Terminal	D-LV3-07038C	6			1				6" Check valve	any	New	2.28E-03	4.15E-04
CC- Mainline valve	MP 205.8	16					MLV #39	Direct Burial	Gate	any	New	0.00E+00	0.00E+00
CC- Mainline valve	MP 209.8	16					MLV #40	Direct Burial	Check	any	New	0.00E+00	0.00E+00
CC- Mainline valve	MP 226.5	16					MLV #41	Direct Burial	Gate (MOV) (there is a by pass per PFD)	any	New	0.00E+00	0.00E+00
CC- Mainline valve	MP 235.6	16					MLV #42	Direct Burial	Gate	any	New	0.00E+00	0.00E+00
CC- Mainline valve		6		2				Direct Burial	6" gate valve (each mainline check valve comes with a 6" check valve)	any	New	4.55E-03	8.30E-04
CC- Mainline valve		2		16	8			Direct Burial	2" TOR with cap, each valve has two.	any	New	1.28E-01	2.34E-02
TOTAL EXISTING		57	116	103	1	1						1.11E+00	2.03E-01
TOTAL NEW*		68	258	170	1	3						2.30E+00	4.20E-01
NET INCREASE		11	142	67	0	2						1.19E+00	2.17E-01

NOTES

only valve size $\geq 1"$ is considered here. For no flange connection valve, it is $\geq 3"$, assume weld connection, or thread connection. For pump, the lube oil system and seal fluid system is included the pump package. Neglect all the connection since they are less than 1" Ground drain valve is not included since the valve have negligible emission compared to open gravity drain The plug valve (ball, gate) could have flange connection depend on the valve model and vendor. For Las Vegas terminal, the Prover replacement is pending, in any case, it will not affect the emission, so it is not included here. Area 3 is from MP 195 to the end of CNX project in Las Vegas. All the information and data identified above are from the design PID and drawing in 2008. They may be changed in the final design. * A 25% component counts buffer were added into the total new component in order to be conservative included the possible changes in the final designs of pipeline. (add 1 for the component with 0 total count)
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Calnev Pipeline Expansion Project
Summary- Operational Emissions for General Conformity
(2012/10/09)

TOC Emission Factors

Equipment Type	Product Service	Component Count	Average Emission Factors (Kg/hr /source)*	Emissions (tons/yr /source)	Emissions (lbs/day /source)
Fittings (connectors and flanges)	Light Liquid	1	8.00E-06	7.73E-05	4.23E-04
Others (compressors and others)**	Light Liquid	1	1.30E-04	1.26E-03	6.88E-03
Pump (seals)	Light Liquid	1	5.40E-04	5.21E-03	2.86E-02
Valve	Light Liquid	1	4.30E-05	4.15E-04	2.28E-03

* Average emission factors of organic gas for terminal from *Protocol for Equipment Leaks Emissions Estimates, EPA-453/R-95-017*

** Others include all equipment type other than valves, pumps and flanges (i.e. fittings, hatches, sight glass, diaphragm, meters)

TOC (total organic compound) includes VOC and non-VOC's (such as methane and ethane)

It is assumed all TOCs are VOC for this estimations.

Sump Tank VOC Emissions

Equipment	Product*	Control Equipment	Control Efficiency (%)	Emission Factor (lb/1000 gal)**	Throughput (gal/year)** *	Uncontrolled VOC		Controlled VOC	
						(tons/year)	(lbs/day)	(tons/year)	(lbs/day)
Sump Tank	Gasoline/Diesel/Jet	Vapor Recovery/Thermal Oxidizer	99.50	Filling underground tank	7.30	153300	0.56	3.07	0.003
				Underground tank breathing	1.00		0.08	0.42	0.000
				Tank truck loading****	5.00		0.38	2.10	0.002
				Total			1.02	5.59	0.005
									0.028

* Use gasoline for emissions calculations (worst case/highest emissions)

** From AP-42, Chapter 5, Table 5.2-5 & 5.2-7

*** Throughput = 10% of tank volume per day (communication with Dave Andries); 4200 * 0.1 gal/day* 365 days/year

**** Sump tank is equipped with a truck load connection

APPENDIX C
SCAQMD COMMENT LETTER ON DEIS/EIR (07/06/2012)



South Coast Air Quality Management District

21865 Copley Drive, Diamond Bar, CA 91765-4182
(909) 396-2000 • www.aqmd.gov

E-MAILED: JULY 6, 2012

July 6, 2012

Mr. Rich Rotte, Realty Specialist BLM_CA_CalNev_EIS@blm.gov
Bureau of Land Management
Barstow Field Office
2601 Barstow Road
Barstow, CA 92311

Draft Environmental Impact Statement/ Environmental Impact Report (Draft EIS/EIR) for the Proposed CALNEV (Kinder-Morgan) Pipeline Expansion Project

The South Coast Air Quality Management District (AQMD) appreciates the opportunity to comment on the above-mentioned document. The following comments are meant as guidance for the Lead Agency and should be incorporated into the Final NEPA/CEQA document.

In the project description, the lead agency proposes the construction, operation and maintenance of a new 16-inch pipeline and ancillary facility to carry refined petroleum products from an existing facility in Colton, California to an existing facility in Las Vegas, Nevada. The proposed new pipeline would parallel two existing pipelines for most of the Nevada to California route. Part of the new pipeline would be installed along a 23-mile right of way (ROW) within the boundaries of the South Coast Air Basin in San Bernardino County. Along this 23-mile section, about an 11-mile section of the new pipeline passes through heavily populated neighborhoods and a high school in the cities of Rialto and Colton.

In the air quality section of the Draft EIS/EIR, the lead agency has determined that construction air quality impacts exceed recommended daily thresholds of significance. The AQMD staff recommends that additional feasible construction mitigation measures be considered in the Final NEPA/CEQA document. In addition, although the lead agency has included detailed supporting documentation for construction emission estimates including greenhouse gas emissions, the AQMD staff is concerned that a more detailed analysis for operational emissions was not included in the draft document. Further, the project description and air quality analysis do not address whether new equipment will be utilized at either the current or new pumping booster stations as a result of the proposed project. Installation of additional equipment at existing facilities or construction of new pumping stations within AQMD's jurisdiction may potentially require further permitting action. Detailed comments are attached to this letter.

July 6, 2012

Please provide the AQMD with written responses to all comments contained herein prior to the adoption of the Final EIS/EIR. The AQMD staff is available to work with the Lead Agency to address these issues and any other air quality questions that may arise. Please contact Gordon Mize, Air Quality Specialist – CEQA Section, at (909) 396-3302, if you have any questions regarding these comments.

Sincerely,



Ian MacMillan
Program Supervisor, Inter-Governmental Review
Planning, Rule Development & Area Sources

IM:AD:GM

SBC120327-02
Control Number

Air Quality Analysis - Operations

1. In the project description, the lead agency has listed activities that will result in potential air quality operational impacts from activities including emissions from the potential new equipment at existing or potential new pumping booster stations, pipeline and tank off-gassing, etc. Based on the limited information in the operational air quality analysis, more detailed information is needed in the Final NEPA/CEQA document to demonstrate that operational impacts will be less than significant. The SCAQMD staff suggests that to further demonstrate its findings, the lead agency should quantify and document all potential project long-term air quality impacts (e.g., emissions from connections, valves, flanges, vehicular emissions, delivery trucks, worker trips, etc.) to demonstrate that project emission impacts are not significant. Should the lead agency determine that emission estimates exceed recognized thresholds of significance, mitigation measures should be adopted and included in the final document to reduce project air quality impacts to less than significant. Questions concerning potential AQMD permits and applicable rules concerning the proposed new equipment can be directed to AQMD staff at (909) 396-2618.

In addition, the lead agency should also cite compliance with AQMD Rule 1173 – Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants in the Final NEPA/CEQA document since potential emissions may be generated from components (connections, valves, flanges, etc.) located at the new pump station and along the pipelines.

General Conformity

2. For general conformity purposes, the lead agency can rely on the 2007 Air Quality Management Plan (AQMP) for general conformity purposes in Draft EIS/EIR, as the 2012 AQMP has not yet been approved. As project construction is expected to occur in the 2013-2015 time frame, the reduction in NOx emissions from the ports located within the South Coast Air Basin (SCAB) due to the recession can cover the approximate 90 tons per year that the proposed project will add, hence there AQMD staff has no comment on potential general conformity impacts.

Emergency Generator(s)

3. In the project description, the lead agency states that the existing pumping station and the proposed new pumping station pipeline pumps would be powered electrically. In the event that emergency generator equipment will be used, AQMD permits would be required for the generator(s). Questions concerning potential AQMD permits and applicable rules can be directed to AQMD staff at (909) 396- 2618.

Contaminated Soils

4. In the project description, the lead agency describes trenching activities that might disturb soil containing petroleum hydrocarbons. In the event that any potential soil excavation activities disturb soil that has the potential to be classified as a hazardous waste, (e.g., petroleum hydrocarbons, etc.) contaminated sites would be subject to SCAQMD Rule 1166 – Volatile Organic Compound Emissions from Decontamination of Soil and that compliance should be referenced in the Final EIS/EIR.

Construction Mitigation Measures

5. In the Draft EIS/EIR, the lead agency has determined that project construction impacts exceed the SCAQMD recommended significance threshold for VOC, NOx, CO, PM10, and PM2.5, the AQMD staff recommends the following changes and additional mitigation measures during construction in addition to the measures proposed starting on page 3.6-29 to further reduce emissions, if applicable and feasible.

Recommended changes:

MM AQ-1b: Low Emission Construction Equipment.

- All off-road diesel-powered construction equipment with a rating greater than 50 horsepower would be required to utilize compliant with EPA Tier 3 or higher non-road engine standards. In addition, all retrofitted construction equipment shall be outfitted with BACT devices certified by CARB. Any emissions control device used by the contractor shall achieve emissions reductions that are no less than what could be achieved by a Level 2 or Level 3 diesel emissions control strategy for a similarly sized engine as defined by CARB regulations.
- A copy of each unit's certified tier specification, BACT documentation, and CARB or SCAQMD operating permit shall be provided at the time of mobilization of each applicable unit of equipment.

MM AQ-1c: Construction Emissions Reduction Plan.

- Require that all on-road vehicles be less than 10 years old, and the use of 2010 and newer diesel haul truck (e.g., material delivery trucks and soil import/export, if applicable). If the lead agency determines that 2010 model year or newer diesel trucks cannot be obtained, the lead agency shall use trucks that meet EPA 2007 model year NOx and PM10 emission requirements.

Recommended additions:

- Limit the amounts of daily soil disturbance to the amounts analyzed in the Draft EIS/EIR.
- Suspend all excavating and grading operations when wind speeds (as instantaneous gusts) exceed 25 mph;
- Prohibit truck idling in excess of five minutes, on- and off-site.
- Reroute construction haul trucks away from congested streets or sensitive receptors areas.
- Provide temporary traffic controls such as a flag person, during all phases of construction to maintain smooth traffic flow.
- Provide dedicated turn lanes for movement of construction trucks and equipment on- and off-site.
- Coordinate with local school officials to minimize construction impacts on school activities.

For additional measures to reduce off-road construction equipment, refer to the mitigation measure tables located at the following website:
www.aqmd.gov/ceqa/handbook/mitigation/MM_intro.html .